



Gujarat State Council for Physiotherapy  
Gujarat State

ગુજરાત સ્ટેટ કાઉન્સિલ ફોર ફીઝિયોથેરાપી

ગુજરાત રાજ્ય

Government Spine Institute, Civil Hospital Compound, Asarva, Ahmedabad - 380016  
ગવર્નમેન્ટ સ્પાઈન ઈન્સ્ટીટ્યુટ, સીવીલ હોસ્પિટલ કમ્પાઉન્ડ, અસારવા, અમદાવાદ-૩૮૦૦૧૬

Programme & Subject:  
**Bachelor of Physiotherapy - B.P.T.**

(4½ Year Degree Course)

**Regulations & Curriculum**

**PROPOSED**

## **BACHELOR OF PHYSIOTHERAPY (BPT)**

### **Introduction:**

The Bachelor of Physiotherapy program shall be under the Faculty of Medicine. The name of the Degree program shall be Bachelor of Physiotherapy (or, Bachelor of Physical Therapy) – B.P.T

These REGULATIONS & CURRICULUM will be applicable from the academic year 2017-2018 and thereafter.

### **LEARNING OBJECTIVES:**

The purpose of this curriculum is to delineate the cognitive, affective, and psychomotor skills deemed essential for completion of this program. At the completion of this course, the student should be –

1. Able to perform as a competent physiotherapist who will be able to examine, evaluate, diagnose, plan, execute and document physiotherapy treatment independently or along with the multidisciplinary team.
2. Able to evaluate patients for impairments and functional limitations and able to execute all routine physiotherapeutic procedures as per the evaluation.
3. Able to operate and maintain physiotherapy equipment used in treatment of patient, physiotherapy treatment planning (both electrotherapy and exercise therapy) & procedures independently.
4. Able to provide patient education about various physiotherapeutic interventions to the patient and care givers.

### **EXPECTATIONS FROM THE FUTURE PHYSIOTHERAPY GRADUATES**

1. Coursework entitles independent physiotherapy assessment and treatment by the graduates.
2. The coursework is designed to train students to work as independent physiotherapists or in conjunction with a multidisciplinary team to diagnose and treat movement dysfunctions as per red and yellow flags.
3. Course will develop skill in the graduate's physical & functional diagnosis, treatment planning, management, and administration of physiotherapy treatment for the patient support.
4. Graduates can find employment opportunities in Hospitals/Nursing homes/Sports Teams/Fitness Centers/Community Rehabilitation /Health planning boards/Health promotions services in both private and public sectors as well as in independent physiotherapy clinics.
5. Physiotherapy graduate is encouraged to pursue further qualification to attain senior position in the professional field and to keep abreast with the recent advances, new technology and research. The professional should opt for continuous professional education credits offered by national and international institutes.

### **Terminal OBJECTIVES (Expected Outcomes):**

1. The graduate will be a competent and reflective physiotherapy practitioner who can function safely and effectively while adhering to legal, ethical, and professional standards of practice in a multitude of physiotherapy settings for patients and clients across the

lifespan and along the continuum of care from wellness and prevention to rehabilitation of dysfunction.

2. The graduate will utilize critical inquiry and evidence based practice to make clinical decisions essential for autonomous practice.
3. The graduate will function as an active member of professional and community organizations. The graduate will be a service-oriented advocate dedicated to the promotion and improvement of community health.
4. The graduate will demonstrate lifelong commitment to learning and professional development.



## O. GEN. B.P.T.-1

### **CRITERIA OF ELIGIBILITY FOR ADMISSION**

- A candidate applying for the degree of B.P.T being eligible for admission to the Physiotherapy College affiliated to UGC recognized University must have passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board and passed in Physics, Chemistry and Biology and English.

Or

- Candidates who have studied abroad and have passed the equivalent examination as per the guidelines of the Association of Indian Universities to determine the eligibility and must have passed in the subjects: Physics, Chemistry, Biology, and English up to 12th Standard level.
- Admission of student in Physiotherapy will be based on aggregate 45% of Physics, Chemistry and Biology.
- Candidate must have appeared in NEET with 45%.
- He /She has attained the age of 17 years as on 31<sup>st</sup> December of concerned year.
- He/she should furnish at the time of submission of application form, a certificate of Physical fitness from a registered medical practitioner that the candidate is physically fit to undergo Physiotherapy course.
- A candidate fulfilling above requirements will be provisionally admitted in the First Year of B.P.T Degree Programme, as per the rules of Admission Committee for Professional Medical Educational Courses of Gujarat and/or Government of Gujarat.

## O. GEN B.P.T - 2

### **DURATION OF COURSE:**

B.P.T is 4½ years regular & fulltime degree programme. The 4½ years includes **4 academic years for study and 6 months** (minimum 1164 hours) of compulsory rotatory internship.

Academic Year (52 weeks)					
Teaching (40 weeks)		Exam (8 weeks)		Vacation (4 weeks)	
1 <sup>st</sup> term (20 weeks)	2 <sup>nd</sup> term (20 weeks)	Preliminary (4 weeks)	University (4 weeks)	Diwali vacation (2 weeks)	Summer vacation (2 weeks)

- 1 week must include 39 teaching hours
- Hours spent during public holidays should be adjusted at college level.

## O. GEN B.P.T - 3

### **MEDIUM OF INSTRUCTION:**

English shall be the medium of instruction for all the subjects of study and for examination of the course.

#### O. GEN B.P.T - 4

##### **ADMISSION TO THE PROGRAMME:**

Admission granted by the Central Admission Committee appointed by the State Government to any student shall be provisional till the Enrollment/ Registration/ Enlistment is made by the University, and in case of admission is granted on the basis of provisional eligibility certificate, the condition & instruction given by the University should be complied within the time limit fixed by the University, otherwise term kept and fees paid by such a student will be forfeited and fees will not be refundable in any conditions.

**Registration:** Candidate admitted to the course in any of the affiliated college shall register with University by remitting the prescribed fees along with the application form for registration duly filled in and forwarded to University through Head of the Institute within stipulated date.

#### O. GEN B.P.T - 5

##### **RE-ADMISSION AFTER BREAK OF STUDY:**

All re-admissions of candidates are subject to the approval of the Vice Chancellor of concerned University.

#### O. GEN B.P.T - 6

##### **COMMENCEMENT OF THE COURSE -**

The course shall commence as per the notification of Central Admission Committee of Government of Gujarat. No student can be admitted in college after 31<sup>st</sup> October.

Duration of first term – 1<sup>st</sup> August to 31<sup>st</sup> January

Duration of second term – 1<sup>st</sup> February to 31<sup>st</sup> July

#### O. GEN B.P.T - 7

##### **SCHEDULE OF EXAMINATION -**

The scheme of examination for the B.P.T course shall be divided into 4 professional examinations; each examination will be held at the end of each respective Academic year.

There will be 1 internal examination (optional) after completion of 4 months of onset of Academic year. There will be 1 Internal/Preliminary exam (compulsory) before University exam. Internal evaluation is based on continuous assessment, for 20% of the marks of the subject. There will be University examination through written paper and/or practical examination for 80% of the marks of the subject at the end of every Academic year.

University has to conduct supplementary exam for failed students after 4 months and before 6 months from previous exam.

#### O. GEN B.P.T - 8

##### **ELIGIBILITY CRITERIA TO APPEAR IN UNIVERSITY EXAMINATION**

**Attendance: A candidate must secure minimum 75% of attendance**

A candidate is required to attend at least 75% of the total classes conducted in a year in all subjects prescribed for that year (separately), in theory and practical / clinical to become eligible to appear for the University examination.

**No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc.**

**Filling of University examination form:** Candidates desirous of appearing for University examination must forward their applications in the prescribed form to the registrar through the Principal of the Institutions on or before the date prescribed for the purpose.

O.GEN B.P.T -09

**STUDENTS' ASSESSMENT:**

The performance of every student in each course will be evaluated as follows:

Internal evaluation based on continuous assessment, for 20% of the marks of the subject;

University examination through written paper and/or practical examination for 80% of the marks of the subject

O.GEN B.P.T -10

**SCHEME OF EXAMINATION: SUBJECTS AND DISTRIBUTION OF MARKS**

First Year B. Physiotherapy						
Sr No	Subject	Theory Marks		Practical Marks		Total Marks
		External	Internal	External	Internal	
1	Human Anatomy	80	20	80	20	200
2	Human Physiology + Biochemistry	80 (55+25)	20 (15+5)	80**	20**	200
3	Psychology + Sociology	80 (40+40)	20 (10+10)	-	-	100
4	Exercise Therapy I & Soft Tissue Manipulation	80	20	80	20	200
5	Biomedical Physics	40	10	-	-	50
Total		360	90	240	60	750

\*\* Only Physiology

Second Year B. Physiotherapy						
Sr No	Subject	Theory Marks		Practical Marks		Total Marks
		External	Internal	External	Internal	
1	Pathology + Microbiology	80 (40 + 40)	20 (10 + 10)	-	-	100
2	Pharmacology	40	10	-	-	50
3	Exercise therapy II	80	20	80	20	200
4	Kinesiology	40	10	-	-	50
5	Psychiatry	40	10	-	-	50
6	Electrotherapy	80	20	80	20	200
Total		360	90	160	40	650

Third Year B. Physiotherapy						
Sr No	Subject	Theory Marks		Practical Marks		Total Marks
		External	Internal	External	Internal	
1	Medicine I (General Med + Skin & V. D.)	80 (55+25)	20 (15+5)	-	-	100
2	Medicine II (Neurology + Pediatrics)	80 (55+25)	20 (15+5)	-	-	100
3	Surgery (General Surgery, Plastic Surgery, NeuroSurgery + Cardiothoracic Surgery) + Obstetrics and Gynecology	80 (55+25)	20 (15+5)	-	-	100
4	Physical & Functional Diagnosis	80	20	80	20	200
5	Orthopedic (Traumatic & Non-Traumatic)	80	20	-	-	100
6	Preventive & Social Medicine	40	10	-	-	50
Total		440	110	80	20	650

Final Year B. Physiotherapy						
Sr No	Subject	Theory Marks		Practical Marks		Total Marks
		External	Internal	External	Internal	
1	Physiotherapy in Neurological Conditions	80	20	80	20	200
2	Physiotherapy in Musculoskeletal Conditions	80	20	80	20	200
3	Physiotherapy in Cardio respiratory & Medical Surgical Conditions	80 (55+25)	20 (15+5)	80	20	200
4	Community Physiotherapy Rehabilitation and assistive technologies	80 (55+25)	20 (15+5)	80	20	200
5	Ethics and Management	40	10	-	-	50
6	Biostatistics & Research Methodology	40	10	-	-	50
Total		400	100	320	80	900

#### O.GEN B.P.T - 11

#### **INTERNAL ASSESSMENT:**

The internal assessment will be done based on continuous evaluation method. Every year, there is one internal examination for both the theory and the practical. For the award of internal marks in theory and practical, other components like attendance, seminar presentations, workshops & conferences attended and journal submission will also be taken into consideration.

**Internal marks calculation - 20% of total Marks of a subject (Separately for theory and practical):**

**Distribution of 20% of Marks is as follows:**

- Internal examinations (Both theory &/or Practical of subject whatever is applicable): 10 % of total marks
- Attendance: 5% of total marks (1 mark for >75% to 80%, 2 marks for >80% to 85%, 3 marks for >85% to 90%, 4 marks for >90% to 95%, 5 marks for >95% to 100%)
- Seminar presentations/Co-curriculum Activities/journal submission/discipline: 5% of total marks

**A candidate must obtain minimum of 35% marks of internal evaluation in each paper for both theory and practical separately before appearing for University examination.**

#### O.GEN B.P.T - 12

#### **UNIVERSITY (EXTERNAL) EXAMINATION:**

**PASSING CRITERIA:** Every student should have an aggregate score of minimum 50%



marks of combined in both the Internal and University Examination but separately in theory and practical examination. (It is not compulsory to pass in section – I and section – II separately.)

**STRUCTURE OF QUESTION PAPERS:**

Paper-style for 80 marks subjects for University (External) examination  
(Including section I and II for 40 marks each)

Duration: **3 Hours**

**Section-I**

Que. 1 Long Answer	1 x 15 = 15	(Any 1 out of 2)
Que. 2 Short Answer	1 x 10 = 10	(Any 1 out of 2)
Que. 3 Very Short Answer	3 x 05 = 15	(Any 3 out of 4)

**Section-II**

Que. 4 Long Answer	1 x 15 = 15	(Any 1 out of 2)
Que. 5 Short Answer	1 x 10 = 10	(Any 1 out of 2)
Que. 6 Very Short Answer	3 x 05 = 15	(Any 3 out of 4)

Applicable for following subjects

Human Anatomy
Exercise Therapy – 1 & Soft Tissue Manipulation
Psychology (Section I) & Sociology (Section II)
Pathology (Section I) & Microbiology(Section II)
Exercise therapy II
Orthopedics (Traumatic and Non-traumatic)
Electrotherapy
Physical & Functional Diagnosis
Physiotherapy in Neurological Conditions
Physiotherapy in Musculoskeletal Conditions

Paper-style for 80 marks subjects for University (External) examination  
(Including section I for 55 Marks and Section II for 25 marks)

Duration: **3 Hours**

**Section-I**

Que. 1 Long Answer	1 x 15 = 15	(Any 1 out of 2)
Que. 2 Short Answer	2 x 10 = 20	(Any 2 out of 3)
Que. 3 Very Short Answer	4 x 05 = 20	(Any 4 out of 5)

**Section-II**

Que. 4 Long Answer	2 x 10 = 20	(Any 2 out of 3)
Que. 5 Short Answer	1 x 05 = 05	(Any 1 out of 2)

Applicable for following subjects

Human Physiology (Section I) & Biochemistry (Section II)
Medicine I (General Med (Section I) + Skin & V. D. (Section II))
Medicine II ( Neurology (Section I) + Pediatrics(Section II))
Surgery (Section I) + Obstetrics and Gynecology (Section II)
Physiotherapy in Cardiorespiratory Conditions (Section I)+ Physiotherapy in General Medical & Surgical Conditions (Section II)
Community Physiotherapy Rehabilitation (Section I)+ Assistive technologies (Section II)

Paper-style for 40 marks subjects for University (External) examination  
(Including section I only)

Duration: **2 Hours**

Section-I

Que. 1 Long Answer	1 x 15 = 15	(Any 1 out of 2)
Que. 2 Short Answer	1 x 10 = 10	(Any 1 out of 2)
Que. 3 Very Short Answer	3 x 05 = 15	(Any 3 out of 4)

Applicable for following subjects

Biomedical Physics
Kinesiology
Pharmacology
Psychiatry
Preventive & Social Medicine
Ethics and Management
Biostatistics & Research Methodology

### GENERAL INSTRUCTIONS FOR UNIVERSITY PRACTICAL EXAMINATION

- (1) Practical examination should be taken and marks should be given by pair of examiners (one internal from same university and one external from another university) only and not by single examiner. For practical exam of Medical subjects, number of examiners is as per Medical Council of India rules.
- (2) Marks should be put directly on the mark sheet. No rough mark sheet should be used.
- (3) Sealed original and duplicate mark sheets should be submitted at the end of each session to the special supervisor or co-coordinator of examination.
- (4) Examiner shall not keep any kind of rough or fair copy of any mark sheet with him/her.
- (5) Number of students per examiner examined per day should not exceed 30 in any circumstances.

O.GEN B.P.T - 13

## REVIEW OF ANSWER PAPERS OF FAILED CANDIDATES

As per the regulations prescribed for review of answer papers by the University

### O.GEN B.P.T - 14

#### INTERNAL EVALUATION FOR REPEATERS:

A candidate who has been declared fail in University examination for either of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> year B.P.T is a repeater for said examination/paper/subject.

The eligibility criteria for appearing for University examination shall be applicable for the repeaters. But, the candidate may appear for the theory and practical held during that Academic year, for the improvement of internal marks for the subsequent University examination in the paper/papers he/she has failed. If candidate does not wish to appear in repeat internal examination, marks obtained in previous internal examination will be counted as final marks.

### O.GEN B.P.T - 15

#### PROMOTION CRITERIA / CARRY OVER SYSTEM:

- i. It is not mandatory to pass in 1<sup>st</sup> year B.P.T Examination to proceed to 2<sup>nd</sup> year B.P.T. class. However, it is mandatory to pass in all subjects of 1<sup>st</sup> year B.P.T examination to be eligible to appear for 2<sup>nd</sup> year B.P.T examination.
- ii. It is not mandatory to pass in 2<sup>nd</sup> year B.P.T Examination to proceed to 3<sup>rd</sup> year B.P.T class. (Students can be allowed to attend classes in 3<sup>rd</sup> B.P.T only if he/she has passed 1<sup>st</sup> B.P.T University exam.) However, it is mandatory to pass in all subjects of 2<sup>nd</sup> year B.P.T examination to be eligible to appear for 3<sup>rd</sup> year B.P.T examination.
- iii. It is not mandatory to pass in 3<sup>rd</sup> year B.P.T Examination to proceed to 4<sup>th</sup> year B.P.T. class. (Students can be allowed to attend classes in 4<sup>th</sup> B.P.T only if he/she has passed 2<sup>nd</sup> B.P.T University exam.) However, it is mandatory to pass in all subjects of 3<sup>rd</sup> year B.P.T examination to be eligible to appear for 4<sup>th</sup> year B.P.T examination.
- iv. A candidate cannot be declared to have passed the examination until he/she has passed in all the subjects in that particular examination.
- v. Student will not be allowed to appear in higher examination unless he/she has passed all subjects of lower examination.
- vi. **Candidates must have 75% attendance of whole academic year to appear for university exam.** (Candidates must have completed one academic year after lower examination to appear in higher examination.)

### O. GEN B.P.T - 16

#### GRACE MARKS:

The Grace Marks may be awarded by the University to a student, who has failed in any paper,

either theory or practical; but it is a subject to discretion of the Vice Chancellor.

#### O. GEN B.P.T - 17

##### **DEFINITION OF TRIAL/ATTEMPT**

First trial/attempt is deemed to take place when the candidate is due to appear as per the regulation of University for the examination. Similarly 2nd, 3rd, etc, trials relating to subsequent examination. There is no limit of numbers of trails in any year to pass examination.

#### O. GEN B. P.T - 18

##### **EXEMPTION FROM RE-EXAMINATION:**

Candidates who have failed in the examination, but obtained pass marks in any subjects shall be exempted from re-examination in those subjects. Candidates who have failed in theory &/or practical in any subject, will have to appear in theory & practical both again for that particular subject.

#### O. GEN B.P.T - 19

##### **DECLARATION OF CLASS:**

A successful candidate-

- i. Who secures 75% and above in the aggregate marks shall be declared to have secured 'FIRST CLASS WITH DISTINCTION' provided he/she passes the whole examination in the FIRST ATTEMPT;
- ii. Who secures above 60% and less than 75% in the aggregate marks shall be declared to have passed the examinations in the 'FIRST CLASS, provided he/she passes the whole examination in the FIRST ATTEMPT';
- iii. Who secures above 50% and less than 60% in the aggregate marks shall be declared to have passed the examinations in the 'SECOND CLASS'; provided he/she passes the whole examination in the FIRST ATTEMPT';
- iv. All other successful candidates who passed the examination in more than first/one attempt or by grace marks shall be declared to have PASS CLASS; irrespective of percent of marks secured.

#### O. GEN B.P.T - 20

##### **COMPULSORY ROTATORY INTERNSHIP**

All students of Bachelor of Physiotherapy must undergo a compulsory rotatory internship for a period of 6 months after passing 4<sup>th</sup> year BPT examination in all subjects. It includes Minimum 1164 hours. Candidate will have to join internship within 15 days of declaration of 4<sup>th</sup> year University examination result. Internship should be done in only Hospitals/Institutions recognized by the Council (List will be declared later). No candidate shall be awarded degree certificate without successfully completing six months of Internship.

The Internship should be rotatory and cover clinical branches concerned with Physiotherapy such as Orthopedics, Cardiothoracic including ICU, Neurology, Pediatrics, General Medicine, General Surgery, Obstetrics, Geriatrics, Women's health, CBR and Gynecology both in-

patient and out-patient services. On completion of all postings, the duly completed logbooks will be submitted to the Principal/Head of program to be considered as having successfully completed the internship program.

O. GEN B.P.T - 21

**DRESS CODE:**

Professionalism with respect to dressing is encouraged throughout the course. It is each student's responsibility to have appropriate dressing during all class assignments and learning activities. Students are supposed to wear apron compulsorily during practical and clinical hours.

O. GEN B.P.T - 22

**MIGRATION/TRANSFER OF CANDIDATES:**

The Vice Chancellor shall have the powers to place any migration/transfer he/she is fit for grant of permission for migration/transfer to candidates undergoing course of study in another University as prescribed by University



## COURSE OF STUDY – SUBJECTS & HOURS DISTRIBUTION

1 credit = 1 classroom lecture per week for 20 weeks (1 term) (makes 20 lectures in one term)

or

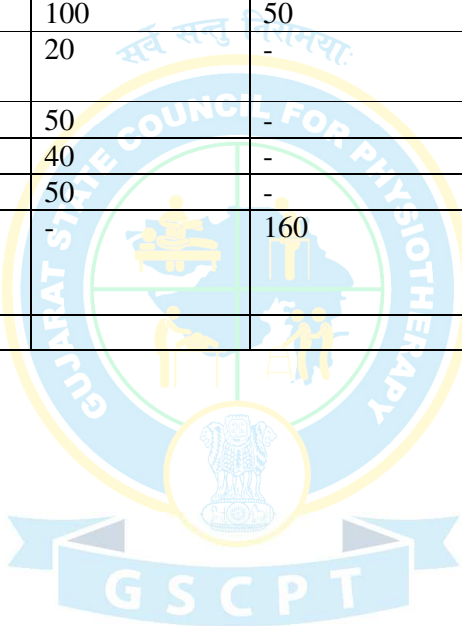
2 Practical/clinical hours per week for 20 weeks (1 term) (makes 40 practical hours in one term)

### YEAR WISE DISTRIBUTION OF HOURS AND CREDITS

#### First Year

Subject	Theory Hours	Practical Hours	Total	Credits
Human Anatomy	125	175	300	11
Human Physiology	150	150	300	11
Biochemistry	40	-	40	2
Psychology	70	-	70	3.5
Sociology	70	-	70	3.5
Exercise Therapy 1 & Soft Tissue Mobilization	150	150	300	11
Biomedical Physics	100	50	150	6
Professional Practice & Ethics*	20	-	20	1
English*	50	-	50	2.5
Computer*	40	-	40	2
Environment Studies*	50	-	50	2.5
Observational Clinical Practice (4 Hours/Week)	-	160	160	4
			1560	60

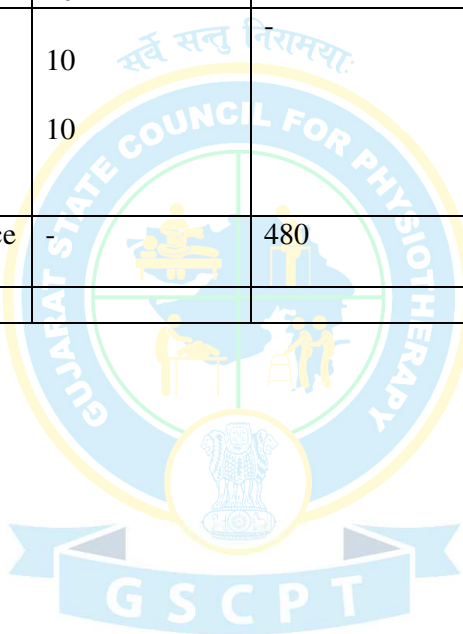
\*Not for university exam.



### Second Year

Subject	Theory Hours	Practical Hours	Total	Credits
Pathology	70	-	70	3.5
Microbiology	70	-	70	3.5
Pharmacology	70	-	70	3.5
Kinesiology	90	-	90	4.5
Exercise Therapy II	160	150	310	16
Electrotherapy	160	150	310	16
<u>Miscellaneous Medicine Subjects*</u>		-		
Radiology	10			
ENT	10			
Ophthalmology	10		30	1.5
Psychiatry	70	-	70	3.5
Allied Therapeutics*	40	-	40	2
<u>Recent Trends*</u>				
Professional Practice And Ethics	10		10	
Introduction To Evidence Based Practice And Seminars	10		10	1
Supervised Clinical Practice (2 Hours/Day)	-	480	480	12
			1560	67

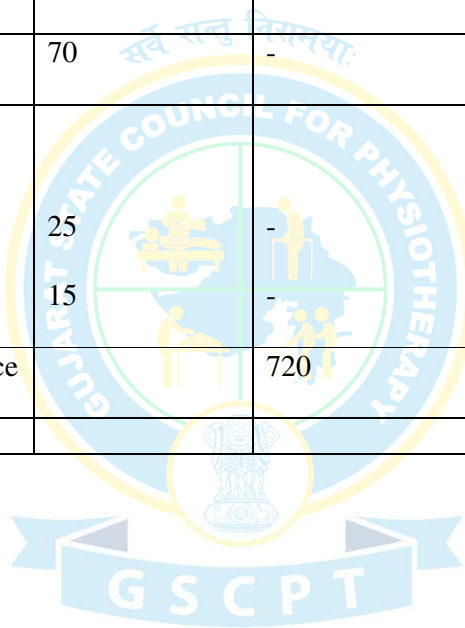
\*Not for university exam.



**Third Year**

<b>Subject</b>	<b>Theory Hours</b>	<b>Practical Hours</b>	<b>Total</b>	<b>Credits</b>
General Medicine	80	-	80	4
Skin & V.D.	30	-	30	1.5
Neurology	70	-	70	3.5
Pediatrics	50	-	50	2.5
General Surgery	50	-	50	2.5
Cardiothoracic Surgery	40	-	40	2
<u>Specialty Surgeries</u>				
Plastic Surgery	20		20	
Neurosurgery	10		10	
Obstetrics & Gynecology	40	-	40	2
Physical & Functional Diagnosis	120	100	210	8.5
Orthopedics ( Traumatic & Non Traumatic)	120	-	120	6
Preventive & Social Medicine	70	-	70	3.5
<u>Recent Physiotherapy Trends*</u>				
Evidence Based Physiotherapy & ICF Seminar	25	-	25	
Professional Practice & Ethics	15	-	15	2
Supervised Clinical Practice (3 Hours/Day)		720	720	18
			1560	56

\*Not for university exam.





### Final Year

Subject	Theory Hours	Practical Hours	Total	Credits
Physiotherapy In Musculoskeletal Conditions	120	20	140	6.5
Physiotherapy In Neurological Conditions	120	20	140	6.5
Physiotherapy In Cardio respiratory and medical surgical conditions	100	20	120	5.5
Community Physiotherapy Rehabilitation	60		60	3
Assistive Technologies	30	-	30	1.5
Biostatistics & Research Methodology	50	-	50	2.5
Recent Practice Trends				
Professional Practice & Ethics	20		20	2
Administration, Management And Marketing	20		20	
Supervised Clinical Practice (4 Hours/Day)	-	960	960	24
Research Project & Field Work*		20	20	0.5
			1560	52

\*Not for university exam.

➤ **6-month compulsory rotatory internship: 1144 Hours**



**COURSE CONTENTS**  
**FIRST YEAR B. PHYSIOTHERAPY**

**1. HUMAN ANATOMY**

**OBJECTIVES:**

At the end of the course, the student will be able to:

- 1) Acquire the knowledge of structure of human body in general.
- 2) Understand the regional anatomy in detail
- 3) Anatomical changes right from embryonic period till old age
- 4) Understand histological features of various organs
- 5) Understand its application in medical science

**SYLLABUS:-**

- 1 GENERAL ANATOMY**
  - a) Introduction & anatomical terms
  - b) Skin, Superficial Fascia & deep fascia
  - c) CVS, Portal system, collateral circulation & arteries
  - d) Lymphatic system
  - e) Osteology
  - f) Myology
  - g) Syndesmology (joints)
  - h) Nervous system
- 2 MYOLOGY, OSTEOLOGY AND ARTHROLOGY**
  - a) Fascia & muscles of scalp and face
  - b) Muscles of mastication
  - c) Temporomandibular joint
  - d) Muscles of orbit & related nerves
  - e) Superficial and lateral cervical muscle
  - f) (platysma, trapezius, SCM)
  - g) Anterior triangle of neck-suprahyoid&infrahyoid
  - h) Anterior and lateral vertebral muscles
  - i) Cervical plexus
  - j) Cranial nerve (7th & 8th)
  - k) Cranial nerve (9th , 10th , 11th , 12th)
  - l) Sub occipital triangle &sub occipital muscles
  - m) Joints of vertebral column to cranium
  - n) Muscles of thorax and movement of respiration
  - o) Joints of thorax including sternochondral & chondrocostal joints

- p) Muscles of abdomen
- q) Muscles of pelvis
- r) Muscles of perineum
- s) Vertebral joint
- t) Joints of pelvis (lumbosacral, sacrococcygeal, pubic symphysis)
- u) Deep muscles of back
- v) Muscles connecting upper limb to vertebral column with regional structures
- w) Scapular muscles including regional structures
- x) Muscles of arm
- y) Axilla and brachial plexus
- z) Joints of shoulder girdle
- aa) Shoulder joint
- bb) Anterior antebrachial muscles (front of forearm) with regional structure
- cc) Posterior antebrachial muscles (back of forearm) with regional structures
- dd) Elbow joint & cubital fossa
- ee) Radioulnar joint (superior, middle and inferior)
- ff) The retinacula, fascia and synovial sheath of wrist and hand
- gg) Muscles of hand
- hh) Radiocarpal / wrist joint
- ii) Other joints of hand
- jj) Muscles connecting lower limb to vertebral column with regional structures
- kk) Muscles of iliac region (psoas muscle) and lumbar plexus
- ll) Anterior femoral muscles (front of thigh) including regional structures
- mm) Medial femoral muscles (adductor compartment) including regional structures
- nn) Muscles of gluteal region including regional structures
- oo) Posterior femoral muscles (back of thigh)
- pp) including regional structures
- qq) Hip joint
- rr) Anterior crural muscles including regional structures
- ss) Lateral crural muscles including regional structures
- tt) Posterior crural muscles including regional structures
- uu) Knee joint
- vv) Popliteal fossa
- ww) Muscles of foot
- xx) Tibiofibular joint (superior, middle and inferior)

yy) Talocrural joint ( ankle joint)

zz) Joints of foot & Arches)

**3 NERVOUS SYSTEM**

- a) Introduction to nervous system & meanings
- b) Spinal cord & peripheral nerves and vertebral canal
- c) Brain stem-1
- d) Brain stem-2
- e) Cerebellum
- f) Diencephalon with basal ganglia
- g) Limbic system with olfactory region
- h) Cerebrum & functional areas
- i) Spinal tracts & overview of CNS – I
- j) Spinal tracts & overview of CNS – II

**4 RESPIRATORY SYSTEM**

**5 DIGESTIVE SYSTEM**

**6 URINARY SYSTEM**

**7 ENDOCRINE SYSTEM**

**8 REPRODUCTIVE SYSTEM**

**9 SPECIAL SENSORY ORGANS AND SENSATIONS**

**10 CARDIOVASCULAR SYSTEM (Heart & Vessels)**

**11 HISTOLOGY**

- a) Cell
- b) Epithelia
- c) Connective tissue (general)
- d) Cartilage
- e) Bone
- f) Muscles
- g) Nerves
- h) Blood and phagocytic system
- i) Lymph and lymphatic system
- j) Blood vessels
- k) Skin and its appendages
- l) Central nervous system

**12 General embryology**

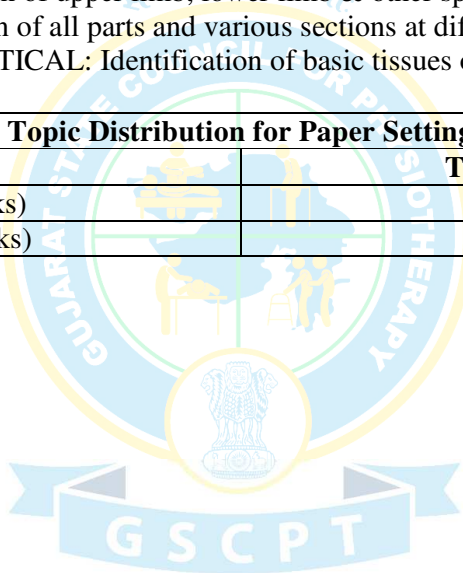
- a) Spermatogenesis
- b) Structure of Spermatozoon
- c) Oogenesis
- d) Ovarian follicle

- e) Fertilization
- f) Formation of germ layers
- g) Placental development
- h) Brachial arches
- i) Development of skeletal system
- j) Development of all type muscular system
- k) Development of locomotor system
- l) Development of nervous system

**Note:-**

1. Dissection of upper and lower limbs & back.
2. Identification of anterolateral abdominal wall, posterior abdominal wall & thoracic cage.
3. Anatomical position & description of all bones.
4. Surface marking in cadaver and living body.
5. Radiological examination of upper limb, lower limb & other special X-rays.
6. In BRAIN: Identification of all parts and various sections at different levels.
7. In HISTOLOGY PRACTICAL: Identification of basic tissues of body.

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topic Sr. No.</b>
I (40 Marks)	1-6
II (40 Marks)	7-12



## 2. HUMAN PHYSIOLOGY

### OBJECTIVES:

At the end of the year the student will be able to:

- 1) Acquire the knowledge of functions of various systems of human body
- 2) Understand the role of hormones, enzymes, and other different types of cells of Human body.

### SYLLABUS: -

#### 1. General Physiology:

- a) Cell Structure and organelle.
- b) General Principles of Biophysics
- c) Body Fluid compartments.

#### 2. Blood:

- a) Composition of blood, Plasma, protein formation and their function.
- b) Structure, formation and functions of R.B.C.
- c) Structure, formation and functions W.B.Cs. and Platelets.
- d) Coagulation and its effects on bleeding, clotting time.
- e) Blood groups and their significance, Rh. factor.
- f) Reticulo-Endothelial system, jaundice, structure and functions of spleen.
- g) Haemoglobin and E.S.R.

#### 3. Cardiovascular System:

- a) Structure, properties of heart muscle and nerve supply of heart, Structure and function of arteries, arterioles, capillaries and veins.
- b) Cardiac cycle and heart sounds.
- c) Cardiac output measurement & affecting factors
- d) Heart rate and its regulation, cardio vascular reflexes.
- e) Blood pressure, its regulations and physiological variations.
- f) Peripheral resistance, Factors controlling, Role in B.P.
- g) Haemorrhage.
- h) Changes in muscular exercise.

#### 4. Respiratory System:

- a) Mechanism of respiration, Intra-pleural and intra pulmonary pressure.
- b) Lung volumes and capacities.
- c) O<sub>2</sub> and CO<sub>2</sub> carriage and their exchange in tissues and lungs.
- d) Nervous chemical regulation of respiration - Respiratory Centres. Respiratory states - anoxia, asphyxia, Cyanosis, Acclimatization.

#### 5. Digestive System:

- a) General outline and salivary digestion
- b) Gastric secretion and its mechanism of secretion and functions.
- c) Digestion, absorption and metabolism of proteins.
- d) Structure, Secretions and Functions of Livers.

#### 6. Nutrition:

- a) Digestion, absorption and metabolism of carbohydrates.
- b) Digestion, absorption and metabolism of fats.
- c) Digestion, absorption and metabolism of proteins.
- d) Vitamins, sources, functions and resources.
- e) Balanced diet in different age groups and occupation.

#### 7. Endocrines:

- a) Anterior Pituitary.

- b) Posterior Pituitary and parathyroid.
- c) Thyroid.
- d) Adrenal Cortex.
- e) Adrenal Medulla, thymus.
- f) Pancreas and Blood sugar regulation.

**8. Reproductive System:**

- a) Sex determination and development, puberty,
- b) Male sex hormones and their functions, spermatogenesis.
- c) Female sex hormones and formation of urine, G.F.R. and Tubular functions.
- d) Pregnancy, functions of placenta and lactation.

**9. Excretory System:**

- a) Gross and minute structure of kidney and features of renal circulation.
- b) Mechanism of formation of urine, G.F.R. and Tubular function.
- c) Renal function tests.
- d) Physiology of micturition

**10. Neuro Muscular Physiology:**

**A. Muscle and Nerve:**

- 1. Structure of neurones, membrane potential and generation of action potential.
- 2. Nerve impulse conduction, saltatory conduction.
- 3. Nerve muscular junction and drugs acting on it - Myasthenia.
- 4. Degeneration and regeneration in peripheral nerves including Wallerian degeneration

**B. Muscle:**

- 1. Type of muscles and their gross structure, stimulus, chronaxie, strength duration curve.
- 2. Structure of Sarcomere - basis of muscle contraction, Starlings law, changes during muscle contraction.
- 3. Electrical - Biphasic and monophasic action potentials.
- 4. Chemical, Thermal and Physical changes, isometric and isotonic contraction.
- 5. Motor units and its properties, clonus, tetanus, all or none law, beneficial effect.
- 6. Nature of voluntary contraction, fatigue.

**11. Nervous System:**

- a) Types and properties of receptors, types of sensations
- b) Structure of synapse, reflex arc and its properties, occlusion, summation, sub minimal fringe etc.
- c) Tracts of spinal cord.
- d) Descending tracts, Pyramidal and Extrapyrmidal.
- e) Hemi section and complete section of spinal cord. Upper and lower motor neuron paralysis.
- f) Cerebral cortex, areas and functions - E.E.G.
- g) Structure - connections and function of cerebellum.
- h) Basal ganglia and thalamus, connections and functions.
- i) Reticular formation, tone, posture and equilibrium.
- j) Autonomic Nervous system.

**12. Special Senses:**

- 1. Broad features of eye, errors of refraction, lesions of visual pathways.
- 2. Speech and its disorders.
- 3. Ear and vestibular apparatus.

## Practical & Demonstrations:

Title

### **Nerve Muscle physiology**

- 1 Gastrocnemius Muscle-Sciatic Nerve Prep.
- 2 Action Potential etc.
- 3 Effect of Temperature on S.M.C
- 4 Effect of Load on Skeletal Muscle Contraction

### **Cardio-Vascular System**

- 5 Graph
- 6 BP
- 7 Radial Pulse
- 8 Spirometry/Respiratory Efficiency Test

### **Instruments**

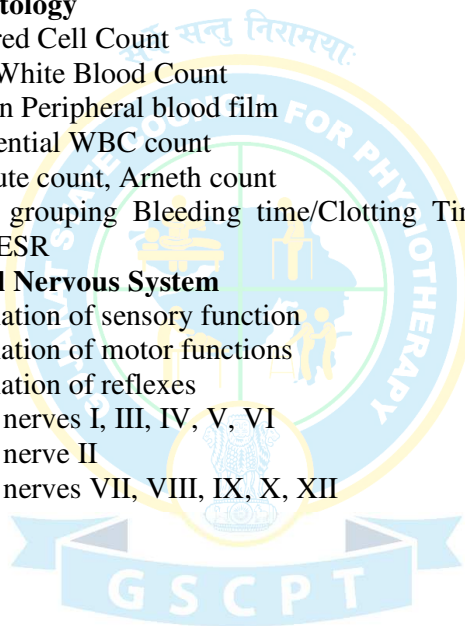
#### **Recording Body Temperature**

#### **Haematology**

- 9 Total red Cell Count
- 10 Total White Blood Count
- 11 Cells in Peripheral blood film
- 12 Differential WBC count
- 13 Absolute count, Arneeth count
- 14 Blood grouping Bleeding time/Clotting Time, Blood ,  
PCV, ESR

#### **Central Nervous System**

- 15 Examination of sensory function
- 16 Examination of motor functions
- 17 Examination of reflexes
- 18 Cranial nerves I, III, IV, V, VI
- 19 Cranial nerve II
- 20 Cranial nerves VII, VIII, IX, X, XII





### 3. BIO-CHEMISTRY

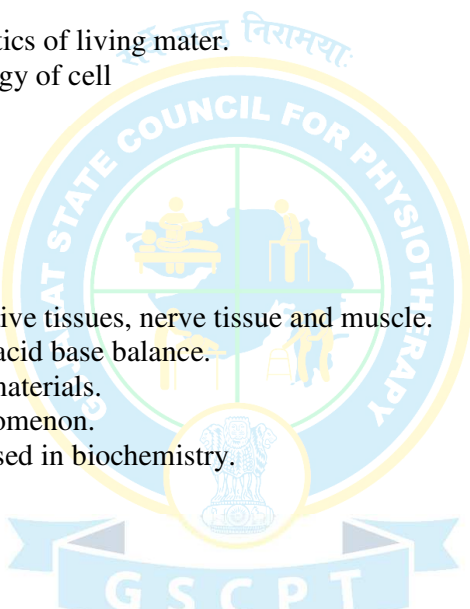
#### OBJECTIVES:

At the end of the course the candidate will be able to

1. Describe the structure and function of the cell in brief.
2. Describe the normal functions of different components of food.
3. Describe basal metabolic rate and the factors affecting the same (in brief) with special reference to obesity.
4. Discuss nutritional aspects of carbohydrates, lipids, proteins, vitamins and minerals and their metabolism with special reference to obesity.
5. Define enzymes and discuss in brief the factors affecting enzyme activity and diagnostic use of enzymes.
6. Describe in detail the biochemical aspects of muscle contraction.
7. Acquire knowledge in brief about the clinical biochemistry, with special reference to liver and renal function tests, blood study for lipid profile, metabolism of fat, carbohydrates, proteins, bone minerals, electrolyte balance, water balance and acid – base balance.

#### Content:

1. Biochemical characteristics of living mater.
2. Biochemistry, morphology of cell
3. Nucleic acids.
4. Proteins.
5. The enzymes.
6. Metabolism.
7. Hormones.
8. Nutrition.
9. Biochemistry of connective tissues, nerve tissue and muscle.
10. Water, electrolyte and acid base balance.
11. Chemistry of biology materials.
12. Physicochemical Phenomenon.
13. Common procedures used in biochemistry.



Topic Distribution for Paper Setting	
Section	Topic Sr. No.
I (55 Marks)	Physiology
II (25 Marks)	Biochemistry

## 4. PSYCHOLOGY

### **OBJECTIVES:**

At the end of the course the candidate will be able to

1. Define the term psychology and its importance in the health delivery system and gain knowledge of psychological maturation during human development and growth and alteration during ageing process.
2. Understand the importance of psychological status of the person in the health and diseases, environmental and emotional influence on the mind and personality.
3. Acquire the knowledge as to how to deal with the patient.

Reference should be made whenever appropriate to the therapist's relationship with the patient and with his professional colleagues. Emphasis should be laid on the effects of disease on the patient's behaviour.

### **SYLLABUS: -**

1. **Introduction:** Introduction of psychology, brief history, definitions, schools of psychology
2. **Biological foundations of behaviour,** hereditary, environment and logical basis for development, developmental psychology (child).
3. **Learned and unlearned behaviour:** Simple learning and conditioning, social learning. Learning disability in children (counselling for exercise)
4. **Memory:** Phases of memory, short term storage, memory and perception thinking etc. Forgetting testimony and recall of events, memory and ageing
5. **Perception:** Sensory basis of perception, attention and perception, observer error
6. **Motivation and Emotions:** Approaches to motivations, emotional development, influence of early experience. Family and social influences on motivation and behaviour. Thematic Apperception Test developed by A M Mankad based on Maslow theory.
7. **Thinking and Intelligence: Learning** and problem solving, development of conceptual thinking in children. Communication, language and thinking, Measurement of intelligence, influences on intelligence, extent and consequence of individual difference.
8. **Tests:** Wechsler scales, Stanford-Binet Intelligence scale, Bender, and Gestalt - other projective test, Anxiety scale.
9. **Personality:** Nature of personality structure and dynamics, dimensional, psycho analytical and constitutional theories of personality, measurement of personality, culture and personality patterns.
10. **Attitude:** Nature of attitudes and beliefs including prejudice, group influences on attitudes, attitude change, doctor - patient expectations and attitudes, prejudice formation and reduction.
11. **Interpersonal Behaviour:** Experimental analysis on social interaction, studies of the interview situation, behaviour in formal and informal groups, group norms and roles. Leadership in formal and informal groups, group moral, Behaviour therapy, behaviour modification techniques, token economy.
12. **Social Psychology :** nature and scope of social psychology, social interaction, psychological groups and their classification, socialization of the individual, social control (social hereditis) - moves, customs, fashion, propaganda and its techniques.
13. **Stress:** stress and responses, disorders, coping with stressors, four maxims, meditational yoga.
14. **Pain:** Physiological and psychological factors, types of pain, pain measurement.

15. **Psychotherapy and counselling:** Goals, Psychodynamic therapy, Humanistic therapy  
Behaviour therapy- Relaxation training (Jacobson training), Hypnosis, Biofeedback.  
Behaviour modification therapies (BMT) – Operant conditioning techniques, Token economy, Classical conditioning, modelling techniques. Cognitive therapy- Elli's rational/ emotive therapy, Beck's cognitive, Meichenbaum's self-instructional training.



## 5. SOCIOLOGY

### **OBJECTIVES:**

At the end of the course the candidate will be able to

1. Define the term sociology and its importance in the health delivery system.
2. Understand the basic sociological concepts, principles and social process, social institution in relation to the individual family and community and the various social factors affecting the family in the rural and urban communities in India.

The subject will introduce the student to the basic sociological concepts, principles and social processes, social institutions in relation to the individual family and community and the various social factors affecting the family in rural and urban communities.

### **SYLLABUS:-**

#### **1. Introduction:**

- a. Meaning - Definition and scope of sociology.
- b. Its relation with anthropology, psychology, social psychology and ethics.
- c. Methods of sociology - Case study, social survey, questionnaire interview and opinion poll methods.
- d. Importance of its study with special reference to health care professionals.

#### **2. Social factors in Health and disease:**

The meaning of social factors, the role of social factors in health and illness.

#### **3. Socialization:**

- a) Meaning and nature of socialization
- b) Primary, secondary and anticipatory socialization
- c) Agencies of socialization.

#### **4. Social Groups:**

Concepts of social groups influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and rehabilitation settings.

#### **5. Family:**

- a) The family
- b) Meaning and definition
- c) Functions
- d) Types
- e) Changing family patterns
- f) Influence of family on the individuals health, family and nutrition, the effects of sickness on family and psychosomatic disease and their importance to physiotherapy.

#### **6. Community:**

- a) Rural community - Meaning and features - Health hazards of ruralities.
- b) Urban community - Meaning and features -Health hazards of urbanities.

#### **7. Culture and Health:**

- a) Concept of culture
- b) Culture and behaviour.
- c) Cultural meaning of sickness.
- d) Culture and health Disorders

#### **8. Social Change:**

- a) Meaning of social changes.
- b) Factors of social change.
- c) Human adaptation and social change.
- d) Social change and stress.

- e) Social change and deviance.
- f) Social change and health programme.
- g) The role of social planning in the improvement of health and in rehabilitation.

**9. Social Problems of Disabled:**

Consequences of the following social problems in relation to sickness and disability remedies to prevent these problems.

- a) Population explosion.
- b) Poverty and unemployment.
- c) Beggary.
- d) Juvenile delinquency.
- e) Prostitution.
- f) Alcoholism.
- g) Problems of women in employment.

**10. Social Security:**

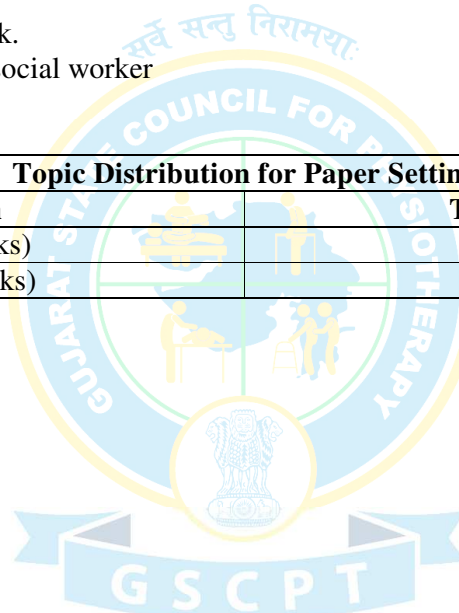
Social security and social legislation in relation to disabled.

**11. Social Worker:**

Meaning of social work.

The role of a medical social worker

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topic Sr. No.</b>
I (40 Marks)	Psychology
II (40 Marks)	Sociology



## **6. EXERCISE THERAPY I & SOFT TISSUE MANIPULATION**

### **6.1 EXERCISE THERAPY I**

#### **OBJECTIVES:**

At the end of the year the student will be able to

1. Understand the basic mechanical principles and effect of exercise, therapeutic modality in the restoration of physical function.
2. Describe and acquire the skills of application and demonstration of the use of various tools of the therapeutic gymnasium and various starting and derived positions.
3. Describe the physiological and therapeutic effect of various movements and demonstrate in various anatomical planes.
4. Acquire the skills of application of various massage manipulations and describe the physiological effects, therapeutic uses, merits – demerits of the same.
5. Demonstrate and acquire the skill of relaxation.

#### **SYLLABUS:-**

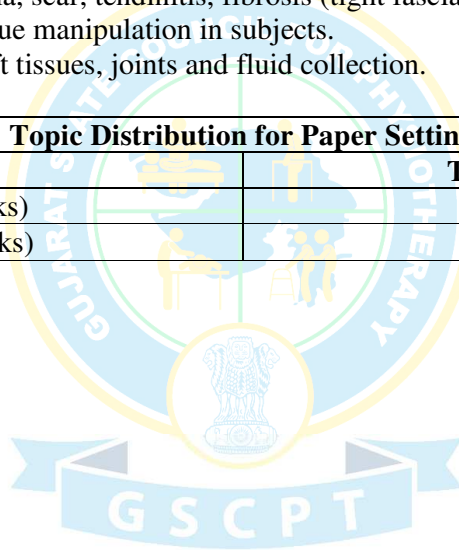
1. Introduction to exercise therapy.
2. Physiological effects and uses of exercise.
3. Use of apparatus in exercise therapy.
4. Fundamental starting positions, derived positions-effects and uses, pelvis tilt & Muscle work for all positions
5. Joint movement - terminology and range axes and planes of movement, levers, measurement of joint movements, goniometry, types of goniometer, bubble and gravity goniometer.
6. Causes of restriction of range of movement - Distinguish between skin, muscles, Capsular contractures.
7. Classification of movements
8. Active movements - Definition, types, techniques, effects and uses. Passive movements - Definition, types, techniques of relaxed passive movements and uses, comparison of both movements.
9. Group work-Criteria of selection of patients, advantages and disadvantages of group class exercises.
10. Home exercises - trick movements.
11. Suspension therapy - definitions of suspension and point of suspension, types of suspension, pulleys and use of pulleys in suspension therapy, application of suspension therapy either to increase the joint range or to increase muscle power.
12. Breathing - Mechanism of breathing (normal), Muscles of respiration, changes in thoracic cage during process of respiration
13. Pursed lip breathing & Glossopharyngeal Breathing - significance.
14. Normal gait cycle – Phases of gait
15. Crutch walking - Types of crutch walking, Use of parallel bars in pre-crutch walking stage, balance exercises, phase of walking, gait training, group of muscles responsible during crutch walking.
16. Progression in crutch walking, measurement of crutches, other walking aids canes, walkers, tripods other types of crutches, crutch - walking on even surface, slopes, climbing up the stair case.
17. Measurement of limb length, methods of measurements.

18. Application of resistance to develop endurance and power, progression of exercises, angle of pull, types of muscle work, exercises - free resisted, assisted - use of gadget apparatus.  
Resisted Exercises - Techniques and types of resistance, SET system (Heavy resisted exercises) Oxford method, Delorme method, Macqueen's method.
19. Free Exercises - Classification, technique, effects of free exercises - application for shoulder, neck, hip and knee joints, techniques of mobilization for stiff joints.
20. Maintenance of record-volume, range of motion, resistance, limb length.

### **6.2 SOFT TISSUE MANIPULATION**

21. Introduction-brief history, definition, classification.
22. Physiological effects and therapeutic uses, contra - indications.
23. Preparation of patient, basic points to be considered before and during massage procedure.
24. Technique, effects and uses of each manipulation and contra-indications.
25. Specific effects of certain manipulations.
26. Massage for arm, leg, neck and upper back face.
27. Massage for oedema, scar, tendinitis, fibrosis (tight fascia)
28. Practice of soft tissue manipulation in subjects.
29. Mobilization of soft tissues, joints and fluid collection.

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topic Sr. No.</b>
I (40 Marks)	1-15
II (40 Marks)	16-29



## **7. BIOMEDICAL PHYSICS**

### **OBJECTIVES:**

At the end of the course the candidate will be able to

1. Describe the fundamentals of general physics and be able to relate its application in physiotherapy
2. Understand basic physical principles of sound, light and heat and their application in physiotherapy field
3. Understand basic aspects of electricity and electronics as related to its application in electrotherapy instruments
4. Describe in brief, certain common electrical components such as capacitors, transformers, valves & transistors and will be able to identify such components.

### **General Physics (Mechanics):**

1. Force – Definition, unit, resolution of forces. Newton's laws of motion. Types of motion, direction and quantity of motion, Speed, Velocity, Work, Energy and Power.
2. Force of gravity, centre of gravity, line of gravity and base. Axes and planes of movement and gravity,
3. Reaction forces, ground reaction force, Equilibrium, determination of equilibrium of a body, Inertia, Acceleration, Momentum and Torque
4. Friction – force of friction, static and dynamic friction, limit of friction, friction a necessity and evil.
5. Simple machine – Lever, mechanical advantage, angle of pull, pulley, wheel and axle, fixed and movable pulley, pendulums, elasticity, spring properties of spring
6. Fluid mechanics – Viscosity, definition, coefficient of viscosity, streamline and turbulent flow, effect of temperature and pressure on viscosity. Principle of Archimedes, laws of floatation, hydrostatic pressure, buoyancy, surface tension, excess pressure in spherical liquefied drop. Physical property of water.
7. Heat: Heat transfer, properties of thermal radiation, Specific heat, thermal capacity, Energy conversion, I and II law of thermodynamics, physical effects of heat – expansion, evaporation, thermionic emission etc., Concept of heat and temperature, measurement of heat thermometry, thermometer. Method of measuring body temperature. Human body temperature. Biophysics of superficial heat and cold.
8. Sound: Origin of sound, Characteristics of sound waves, velocity of sound in air and water, effect of temperature, pressure, density of medium, humidity, wind on sound waves.
9. Frequencies of sound waves, Infrasonic, Normal hearing band and Ultrasonics, Reflection, Refraction and Attenuation of Sound waves, Acoustic Impedance, Interference of sound waves, Resonance, Echo, Doppler effect and Fresnel and Fraunhofer zones in Ultrasonics.
10. Electromagnetic Spectrum: Electromagnetic Radiation: Laws Governing EMR, Laws of Reflection, Refraction, Absorption, Cosine law, Attenuation, Inverse square law. Grothus law etc.
11. Light: Emission and absorption spectra. Electromagnetic spectrum. Laws of transmission, reflection, refraction, absorption. Internal reflection and fibre optics, Interference of light. LASER and its application.

### **Electricity and Electronics:**



1. Structure of atom, Isotopes, States of matter; Compound formation-(covalent formation),
2. Static Electricity: Theories of Electricity, Production of Electric Charge, Characteristic of Charged body, Potential and Capacity, Potential Difference.
3. Current Electricity: Energy sources for electricity, EMF, Resistance, Intensity, Ohm's Law, resistance in Series / Parallel, Devices for regulating Intensity (Types, Construction and working of Rheostat), Electric energy and power, Thermal Effects of Electric (Joule 's Law).
4. Magnetism: Nature, Type, Molecular Theory of Magnetism, Property of Magnet, Magnetic Effect of Electric Current, Electromagnets, Milliamperemeter & Voltmeter (Construction and working), Meters for measuring Ac.
5. Capacitor / Condenser: Principles, Capacity (Measurement and factors determining), Types and Construction, Electric field, lines of force and characteristics of lines of force, Charging and discharging of the condenser, Duration of discharge, discharge through inductance, capacitive reactance and uses of condenser.
6. Electro Magnetic Induction: Principles (Faraday's/Lenz's law), Production, Direction of Induced EMF, Strength of induced EMF, Types (Self and Mutual) and inductive reactance. Eddy Currents, Dynamo, Transformers (Functions, Types, Constrictions), Choke coil.
7. Thermionic Valves (Diode and Triodes), Types of rectification (Half and full wave – Voltage halving and Westinghouse Bridge), Semi Conductors: Types, semiconductor diodes, Metal rectifier & Transistors, Integrated circuits (IC), Picture Circuitry boards (PCB),
8. Main Supply: Production of Electricity, Types, Distribution, Earthing, Types of Plugs & Switches. Fuse.
9. Electric and electronic circuits: Oscillating circuit, Smoothing Circuit, surging circuit, CR circuit, multivibrator circuit, faradic coils (Lewis Jones and Smart Bristow), panel diagram of electrical stimulator, Production of high frequency current by klystron, magnetron
10. Frequencies of Current – Low, Medium and High frequency currents and their characteristics, Biological Cell as a capacitor and resistor, frequency of current and its relation to capacitive reactance (resistance)
11. Types of current – DC and AC, Sources of DC, Necessity for rectification of AC, Use of DC as a therapeutic current and its dangers, Electrical Skin Resistance, Electrolysis, acidic and alkaline reactions under anode and cathode, Electrolytic burns and its prevention
12. Shock: Types (Electric Shock, Earth Shock), Definition, Severity, Effects, Causes and Precautions.

## **8. PROFESSIONAL PRACTICE & ETHICS** (Not for University Exam)

### **OBJECTIVES:**

At the end of the course the candidate will be able to:

1. Be able to understand the moral values and meaning of ethics
2. Acquire bedside manners and communication skills in relation with patients, peers seniors and other professionals.

### **SYLLABUS:-**

1. Introduction to the history of physiotherapy
2. Orientation to the curriculum, clinical areas and geographical location
3. Concept of morality & ethics
4. Concept of professionalism and professional dress code



**9. COMPUTER APPLICATIONS**  
**(Not for University Exam)**

**OBJECTIVES:**

The course enables the students to understand the fundamentals of computer and its basic applications.

**SYLLABUS: -**

**1. Introduction to data processing:**

- a) Features of computers. What are Hardware and Software?
- b) Advantages of using computers. Role and uses of computers. What is data processing?
- c) Application areas of computers and common activities in data processing. Types of data processing, characteristics of application.

**2. Hardware concepts:**

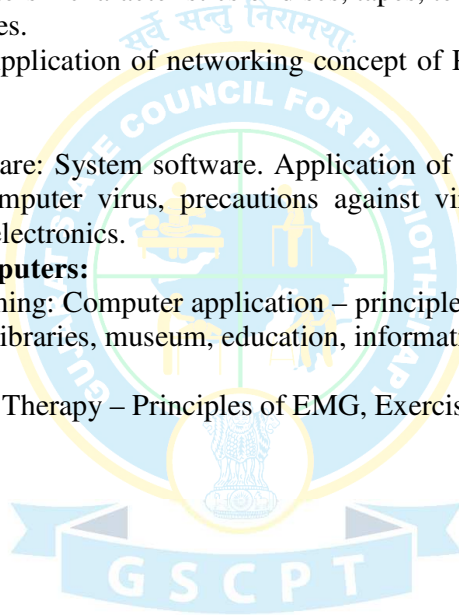
- a) Architecture of computers – characteristics of discs, tapes, terminals, printers, network.
- b) Types of storage devices.
- c) Concept of damage. Application of networking concept of PC system care, floppy care, data care etc.

**3. Concept of software**

- a) Classification of software: System software. Application of software, Operating System, Computer System, computer virus, precautions against viruses, dealing with viruses, computers in medical electronics.

**4. Basic anatomy of Computers:**

- a) Principles of programming: Computer application – principles in scientific research, work processing, medicine, libraries, museum, education, information system.
- b) Data processing
- c) Computers in Physical Therapy – Principles of EMG, Exercise testing equipment, Laser.



## **10. ENGLISH**

**(Not for University Exam)**

Course Outline: The course is designed to help Acquire a good command and comprehension of the English language through individual papers and conferences.

### **SYLLABUS:-**

#### **1. Introduction:**

- a) Study techniques
- b) Organization of effective note taking and logical processes of analysis and synthesis.
- c) Use of the dictionary
- d) Enlargement of vocabulary
- e) Effective diction

#### **2. Applied Grammar:**

- a) Correct usage
- b) The structure of sentences
- c) The structure of paragraphs
- d) Enlargement of vocabulary

#### **3. Written composition:**

- a) Precise writing and summarizing
- b) Writing of Bibliography
- c) Enlargement of vocabulary

#### **4. Reading and Comprehension:**

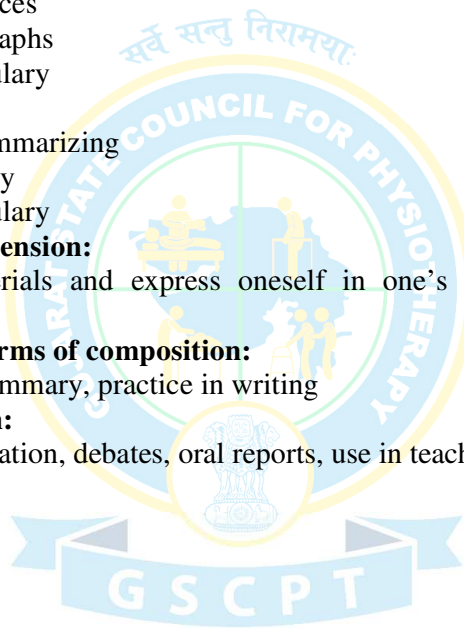
Review of selected materials and express oneself in one's words and enlargement of vocabulary.

#### **5. The study of various forms of composition:**

Paragraph, essay, letter, summary, practice in writing

#### **6. Verbal Communication:**

Discussions and summarization, debates, oral reports, use in teaching.



**11. ENVIRONMENTAL SCIENCES**  
(Not for University Exam, Only for Internal Exam)

**1: Multidisciplinary nature of environmental studies**

- a) Definition, scope and importance
- b) Need for public awareness.

**2: Natural Resources:**

**Renewable and non-renewable resources:**

Natural resources and associated problems.

- a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.
- b) Water resources: Use and over-utilization of surface and ground water, Floods, drought, conflicts over water, dams-benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water Logging, salinity, case studies.
- e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.
- f) Land resources: Land as a resource, land degradation, man induced Landslides, soil erosion and desertification.
- g) Role of an individual in conservation of natural resources.
- h) Equitable use of resources for sustainable lifestyles.

**Unit 3 : Ecosystems**

- a) Concept of an ecosystem.
- b) Structure and function of an ecosystem.
- c) Producers, consumers and decomposers.
- d) Energy flow in the ecosystem.
- e) Ecological succession.
- f) Food chains, food webs and ecological pyramids.
- g) Introduction, types, characteristic features, structure and function of the

Following ecosystem :-

- Forest ecosystem
- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

**4 : Biodiversity and its conservation**

- a) Introduction – Definition: genetic, species and ecosystem diversity.
- b) Biogeographical classification of India
- c) Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic
- d) and option values
- e) Biodiversity at global, National and local levels.
- f) India as a mega-diversity nation
- g) Hot-spots of biodiversity.
- h) Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
- i) Endangered and endemic species of India

j) Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**5 : Environmental Pollution**

- a) Definition, Cause, effects and control measures of:-
- b) Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, nuclear hazards
- c) Solid waste Management: Causes, effects and control measures of urban and Industrial wastes.
- d) Role of an individual in prevention of pollution.
- e) Pollution case studies.
- f) Disaster management: floods, earthquake, cyclone and landslides.

**6 : Social Issues and the Environment**

- a) From Unsustainable to Sustainable development
- b) Urban problems related to energy
- c) Water conservation, rain water harvesting, watershed management
- d) Resettlement and rehabilitation of people; its problems and concerns. Case
- e) Studies
- f) Environmental ethics: Issues and possible solutions.
- g) Climate change, global warming, acid rain, ozone layer depletion, nuclear
- h) Accidents and holocaust. Case Studies.
- i) Wasteland reclamation.
- j) Consumerism and waste products.
- k) Environment Protection Act.
- l) Air (Prevention and Control of Pollution) Act.
- m) Water (Prevention and Control of Pollution) Act
- n) Wildlife Protection Act
- o) Forest Conservation Act
- p) Issues involved in enforcement of environmental legislation.
- q) Public awareness.

**7: Human Population and the Environment**

- a) Population growth, variation among nations.
- b) Population explosion – Family Welfare Programme.
- c) Environment and human health.
- d) Human Rights.
- e) Value Education.
- f) HIV/AIDS.
- g) Women and Child Welfare.
- h) Role of Information Technology in Environment and human health.
- i) Case Studies.

**8: Field work**

- a) Visit to a local area to document environmental assetsriver/ forest/grassland/hill/mountain
- b) Visit to a local polluted site-Urban/Rural/Industrial/Agricultural
- c) Study of common plants, insects, birds.
- d) Study of simple ecosystems-pond, river, hill slopes, etc.

## SECOND YEAR B. PHYSIOTHERAPY

### 1. PATHOLOGY

#### **OBJECTIVES:**

At the end of the course the candidate will be able to:

1. Acquire the knowledge of concepts of cell injury and changes produced thereby in different tissues and organs; capacity of the body in healing process.
2. Recall the etio-pathogenesis, the pathological effects and the clinical-pathological correlation of common infection and non-infectious disease.
3. Acquire the knowledge of concepts of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
4. Correlate normal and altered morphology of different organ systems in different diseases needed to understand the disease process and their clinical significance (with special emphasis to neuro-musculo skeletal and cardiovascular – respiratory system).
5. Acquire knowledge of common immunological disorders and their resultant effects on the human body.
6. Understand in brief, about the hematological diseases and investigations necessary to diagnose them and determine their prognosis.

#### **General Pathology:**

1. Introduction: Aims and objects of study of pathology, definitions of health, disease, causes of disease, methods of study of disease.
2. Inflammation – General morphology, types, phenomenon of acute inflammation.
3. Tissue repair – Wound healing, fracture, skin, nerves, muscles
4. Cell Injury – Degeneration, physical and chemical irritants, ionizing radiations, cellulites.
5. Disturbance of circulation – edema, thrombosis, infarction, embolism.
6. Necrosis, Gangrene
7. Growth and its disorders – atrophy and hypertrophy (pseudo), Hyperplasia
8. Cellular ageing
9. Tumors – definitions, classification, characteristics of benign and malignant tumors, etiology and spread of tumors, systemic effects.
10. Infection – Acute, chronic, including AIDS.
11. Blood-Anemia, definition, classification, etiology, lab investigations, blood picture; Hemorrhagic disorders – causes and classification (hemophilia)
12. Immunity, Hypersensitivity and Auto immune disorders (RA, SLE)

#### **Systemic Pathology:**

(Each condition in this section is to be taught under the specific headings of Causes, Development, Gross and Microscopic only).

1. **Respiratory System:** Pneumonia, Bronchitis, Bronchiectasis, Asthma, Emphysema, Tuberculosis and Carcinoma of Lungs Occupational Lung Diseases
2. **Cardiovascular System:** Rheumatic Heart diseases, Myocardial infarction, Atherosclerosis and other disease of blood vessels – TAO, Buerger's diseases,

- Thrombophlebitis, Congenital Heart diseases,
3. **Alimentary System:** Peptic Ulcer, Ulcerative lesions of intestine
  4. **Liver:** Hepatitis, Cirrhosis
  5. **CNS:** Meningitis, Encephalitis, Cerebral Hemorrhage, CVA, Brief outline of CNS Tumors
  6. **Peripheral Nerves:** Neuritis, Neuralgia, GBS, Neuropathies.
  7. **Bones and Joints:** Osteomyelitis, Osteoarthritis, Septic, Arthritis, Gout, Osteomalacia, Bone Tumors briefly\*-Giant Cell tumor, Osteosarcoma, Ewing's
  8. **Muscles:** Disorder of muscles including Poliomyelitis and Myopathies, Volkman's Ischaemic contracture
  9. **Skin:\*\*\*** Scleroderma, Psoriasis, Autoimmune disorders
  10. **Urinary System:\*\*** Nephritis, Glomerular Nephritis, Nephrotic Syndrome
  11. **Endocrine System:\*\*\*** Thyroid – Thyroiditis and Thyroid tumors, Diabetes





## 2. MICROBIOLOGY

### OBJECTIVES:

At the end of the course the candidate will be able to have sound knowledge of the agents responsible for causing human infections pertaining to CNS, CVS, musculoskeletal and Respiratory system.

#### 1. General Bacteriology:

- Introduction, historical background, classification of micro – organisms
- Morphology of bacteria
- Staining of bacteria
- Sterilization
- Cultivation and culture media

#### 2. Systemic Bacteriology:

- Gram-Positive cocci – Streptococci, Pneumococci, Staphylococci
- Gram-Negative Cocci – Gono and Meningococci
- Gram-Positive Bacilli
- Gram-Negative Bacilli-Typhoid, Cholera, Dysentery
- Aerobic-Diphtheria, T.B., Leprosy
- Anaerobic-Tetanus, Gas Gangrene, Botulism

#### 3. Immunology:

- Immunity, Antigens
- Antibodies, Ag-Ab Reaction
- Agglutination, precipitation
- Hypersensitivity reactions

#### 4. General Virology:

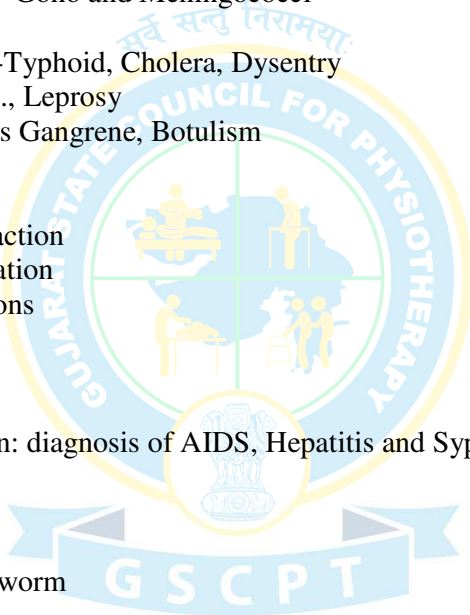
- Poliomyelitis
- Rabies
- Demonstration of test in: diagnosis of AIDS, Hepatitis and Syphilis

#### 5. Parasitology:

- Malaria
- Amoebiasis
- Round worm and loop worm

#### 6. Mycology:

- Candidiasis
  - Ring worm
  - Scabies
7. Aseptic universal precautions & practices  
Biomedical waste and universal precautions



Topic Distribution for Paper Setting	
Section	Topic Sr. No.
I (40 Marks)	Pathology
II (40 Marks)	Microbiology

### 3. PHARMACOLOGY

#### **OBJECTIVES:**

At the end of the course the candidate will be able to

1. Describe pharmacological effects of commonly used drugs by patients referred for physiotherapy; list their adverse reactions, precautions to be taken, contraindications, formulation and route of administration.
2. Identify whether the pharmacological effect of the drug interferes with the therapeutic response of physiotherapy and vice versa
3. Indicate the use of analgesics and anti-inflammatory agents with movement disorders, with consideration of cost efficiency and safety for individual needs.
4. Get the awareness of other essential and commonly used drugs by patients. The basis of their use and common as well as serious adverse reaction.

#### **Syllabus:**

1. Chemical character and general action of drugs
2. Principles of drug administration and routes of administration, distribution, metabolism, excretion of drugs, factors influencing drug reaction, dosage and factors modifying it.
3. Drug toxicity including allergy and idiosyncrasy.
4. Definition, action, indication, contraindication, adverse reaction of the following:
  - a) Drugs acting on PNS: stimulating and inhibiting, cholinergic and anticholinergics. Drugs acting at NM junction. Muscle relaxants
  - b) Drugs acting on CNS: Analgesics, antipyretics, narcotics, anti-inflammatory, anti-epileptic, sedatives, hypnotics, tranquilizers, anticonvulsants, stimulants, psychotherapeutics, alcohol
  - c) Pulmonary effects of general and local anesthetic agents
  - d) Drugs acting on CVS: antihypertensive, vasoconstrictors, vasodilators, diuretics, mucolytic agents. Drugs that influence myocardial contractility and heart rate.
  - e) Drugs acting on Respiratory system: bronchodilators, drugs used in inhalation therapy, drugs acting on CNS and cardio-respiratory system which influence the physical exercise.
5. Antimicrobial Agents
6. Immunological agents and vaccines
7. Chemotherapeutic agents
8. Endocrine Pharmacology: thyroxine, glucocorticoids, anabolic steroids, calcitonin, insulin and hypoglycemic agents
9. The vitamins
10. Irritants and counterirritants

#### 4. EXERCISE THERAPY II

##### **OBJECTIVES:**

At the end of the course the candidate will be able to

1. Describe the biophysical properties of connective tissue and the effect of biomedical loading and factors which influence the muscle strength and mobility of articular and periarticular soft tissue.
2. Acquire the skill of assessment of isolated & group muscle strength, & Range of motion of the joints subjectively & objectively
3. To demonstrate general fitness, exercise and shall gain fitness for oneself

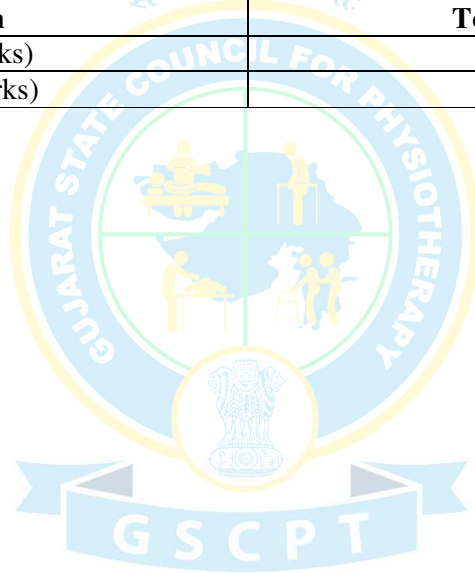
##### **Syllabus**

1. **Passive movements:** Definition, types, technique, effects and uses, CPM unit, comparison of active with passive movements for all joints of extremities, neck and trunk.  
**Stretching:** Definitions related to stretching, types of contractures and differentiation properties of soft tissues affecting elongation and aims of stretching, manual and mechanical stretching, cycle mechanical stretching, indications and aims of stretching, principles and contraindications  
**Traction:** types, effects, principles of application for cervical and lumbar spine, traction to soft tissues of joints – gliding movements
2. **Mobilization:** causes of restriction of R.O.M., prevention of restrictions, techniques of mobilization of various joints of limbs to mobilize joint R.O.M. through functional diagonal patterns, joint mobilization; manipulation-definition, types; joint shapes, types of motion; stretching, glides, compression, traction, indications, contraindications, precautions and conditions for special precautions.
3. Advance soft tissue Mobilization: Basic principles of MET (Muscle Energy Technics), MFR (Myofacial Release Technics), PRT (Positional Release Therapy), NTM (Neural Tissue Mobilization).
4. **M.M.T.:** need of M.M.T., uses, fundamental principles, anatomical and physiological basis, Oxford scale of muscle gradation, principles of isolation, substitution, stabilization, grading procedure for muscles of extremities, neck and trunk. Voluntary control of movement gradation by Bobath, Brunnstrom.
5. **Posture:** \*\*\* types, factors influencing posture, regulation of posture and posture mechanism, pelvic tilt and postural deviations of spine and its treatment  
Crawling exercises: principles, types, effects and uses of Clapp' crawl
6. **Strengthening of muscles(PRE):** \*\*\* Principles involved to prevent muscle wasting, Rood's technique of initiating muscle contraction, progressive strengthening of muscles (loads assisted and resisted exercises), use of equipment, reeducation of muscles and restoration of functions, practice of strengthening of muscles of limbs, neck, trunk and face, emphasis on hand and foot muscles, quadriceps, glutei, triceps, deltoid and face muscles, use of manual and mechanical resistance, contraindications, isometric and isokinetic exercises regime, plyometrics, MET ( Muscle Energy Techniques)
7. **Proprioceptive Neuromuscular Facilitation:** Introduction, responses of NM mechanism, basis techniques of PNF patterns of arm, leg, neck, head and trunk (emphasis on straight patterns), specific techniques of emphasis-repeated contractions – slow reversal, contract and relax, hold and relax, rhythmic stabilization, inhibitory techniques, Bobath Rood's and Kabat.
8. **Relaxation:** Muscle tone, postural tone, general and local relaxation techniques of

relaxation

9. **Neuro Muscular coordination:** Factors governing co ordination, principles of re education, Frenkel's exercises and its techniques
10. **Functional Reeducation:** Mat activities for re education of hemiplegics, paraplegics and cerebral palsy, walking re education in neurological and orthopedic conditions.
11. **Aerobic exercises:** Physiological effects and therapeutic uses, fitness testing, stress testing for healthy and convalescent individuals. Pharmacological aspects of exercises.
12. **Breathing exercises:** Mechanisms of normal breathing, muscles of respiration, changes in thoracic cage during the process of respiration, segmental and diaphragmatic breathing exercises, pursed lip breathing, FET, breathing mechanisms and postural drainage, assistive measures, techniques, indications and contraindications
13. **Hydrotherapy:** Physiological properties of water and hydrodynamics, physiological and applications of Bad Ragaz Technique, indications and contraindications

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topic Sr. No.</b>
I (40 Marks)	1-6
II (40 Marks)	7-13



## 5. KINESIOLOGY

### OBJECTIVES:

At the end of the course the candidate will be able to

1. Acquire the skill of assessment of isolated and group muscle strength subjectively and objectively.
2. Analyze normal human posture and its associated problems, its management.
3. Analyze the various normal musculoskeletal movements during breathing, gait and daily living activities and in terms of biomechanical and physiological principles.

### Application of

1. **Mechanics of joint motion:** Structure and types of joints and types of movements
2. **Mechanics of muscular action:** Classification of muscles, line of pull, types of contractions, role of muscles and tendons, action of two joint motions, non customary action
3. **Skilled Movements:** Rope climbing, cycling, running, ballistic and volitional movements
4. **Impetus:** Impetus to external objects and receiving impetus
5. **Locomotion:** Normal gait analysis: definition of gait, phases of normal gait, normal gait with kinetic and kinematics, abnormal pathological gaits, gait training
6. **Biomechanics of joints:** Kinetics, kinematics and patho-mechanics of joint – hip , knee, ankle, foot, shoulder, elbow, wrist and hand
7. **Biomechanics of spinal column:** Spinal curves, articulations, non contractile soft tissue of column, IV disc, ligaments, intrinsic equilibrium, movements of spinal column and muscle mechanics
8. **Mechanics of pelvic complex:** Pelvis at rest, in standing body and in motion, patho mechanics of pelvis
9. **Mechanics of thorax:** Movements between ribs and vertebrae, sternum and ribs, patho mechanics of respiration
10. **Postural strain and occupational hazards:** Correct use of body mechanics at home, at school and work, recreation, particular application for patients, physiotherapists and other staff.
11. **Kinetics and kinematics of ADL :**Supine to sitting, Sitting to standing, Squatting, Climbing up and down, pushing, pulling, overhead activities, walking, running, jogging.

## 6. PSYCHIATRY

### **OBJECTIVES:-**

At the end of the course, the student will be able to

1. Enumerate various psychiatric disorders with special emphasis to movement, pain and ADL & describe the various causative factors and methods of assessment and management
2. Acquire the knowledge in brief about the pathological and etiological factors, common signs and symptoms and management of various psychiatric conditions
3. Describe in brief the various treatment modalities commonly used.

### **SYLLABUS:-**

#### **1. Mental health:**

- a) Normal Mental Health
- b) Criteria of normality or matured personality
- c) Factors contributing to normal mental health.

#### **2. Study of Abnormal Personality:**

- a) Neurotic
- b) Hysterical
- c) Psychotic
- d) Paranoid
- e) Schizoid
- f) Psychopathic etc.

#### **3. General Etiological Factors:**

- a) Hereditary
- b) Genetical Constitutional
- c) Acquired
- d) Traumatic
- e) Infective
- f) Toxic
- g) Degenerative
- h) Social and Environmental including pathogenic family patterns
- i) Precipitating causes
- j) Frustration and conflicts.

#### **4. Symptomatology and Treatment of Psychoses:**

- a) Functional - Functional Schizophrenic, reaction group, simple, paranoid, catatonic, hebephrenic paranoid state, paranoia, juvenile, schizophrenia, autistic thinking, dementia.
- b) Organic - Toxic confused states, senile psychoses, arteriosclerotic, degenerative, G.P.I.
- c) Affective Disorders: Dynamics of Mania, hypomania, chronic mania, M.P.D. Involutional depression, senile depression, postpartum depressive reactions, reactive and neurotic depression, endogenous depression, suicide (egoistic, Altruistic, Anomic) Epileptic Disorders: Epileptic Psychoses.

#### **5. Neurosis :**

- a) Symptomatology, diagnosis and treatment and psychodynamics of anxiety state, hysteria, conversion reaction, dissociative reaction, dual personality, obsessional neurosis, phobias, hypochondriasis, neurasthenia and mental fatigue.

#### **6. Mental Retardation:**

- a) Definition,
- b) Etiological factors - Prenatal, postnatal, infective, hormonal, congenital.



- c) Types of mental retardation, clinical types-microcephaly, hydrocephalus, mongot, family idiocy, phenylketonuria etc. Symptomatology of various grades of retardation, differential diagnosis and treatments.

**7. Child Psychology:**

- a) Behavior disorders - Nail biting, Enuresis, Truancy, Thumb sucking, Speech difficulties, Pica, Vomiting, Anorexia, delinquency.

**8. Introduction to dynamics of Psychophysical disorders:**

- a) Asthma, skin rashes, hypertension, bowel disorders.  
b) Introduction to treatment in psychiatry - E.C.T., Insulin, coma therapy.  
c) Drug therapy - Tranquilizer, Mood elevators, hypnotics and sedatives, Psychotherapy - Deep and superficial, individual and group, expressive, suppressive, environmental manipulation, re-educative.  
d) Psychodrama  
e) Psychoanalysis  
f) Play Therapy



## **7. ELECTROTHERAPY**

### **OBJECTIVES**

At the end of the course the candidate will be able to

1. Recall the Physics – Principles and laws of electricity, Electromagnetic spectrum, Ultrasound
2. Describe the electrical main supply, Electric shock – precautions
3. Describe and identify various types of electrodes used in therapeutics, resistance offered by the skin and significance of various media used to reduce the same
4. Describe the production, physiological effects, therapeutic uses, merits/ demerits, indications and contraindication of various Low, Medium and High frequency currents and modes. Describe the panel diagrams of the machine
5. Acquire the skill of application of Low, Medium and High frequency currents on models for the purpose of treatment
6. Describe the physiological effects and therapeutic uses of various therapeutic ions to be used for the application of Iontophoresis
7. Describe effects of electromagnetic field at the cellular level and risk factors on prolonged exposure
8. Describe the physiological effects and therapeutic uses of various topical pharmacotherapeutic agents to be used for the application of phonophoresis
9. Acquire an ability to select the appropriate mode as per the tissue specific and area specific application.

### **Syllabus**

#### **1. LOW FREQUENCY CURRENTS**

- a) **Review of physics:** Current, electricity, Ohm's law, Resistance, Rheostats, potentiometers, Electromagnetic induction, capacitors, valves, semiconductors and transistors
- b) **Nerve Muscle Physiology:** Resting potential, action potential, propagation of action potential, motor unit, synapse and synaptic transmission of impulses. Effect of negative and positive electrodes on nerve & accommodation
- c) **Electric shock:** Causes, severity, treatment and precautions Earth shock and its precautions
- d) **Faradic Current:** Definition, characteristic and modified faradic current, sinusoidal current, parameters of faradic stimulation, physiological and therapeutic effects of faradic-stimulation. Indication, contra-indications and precautions, techniques of stimulation- group muscle stimulation, faradic foot bath, faradism under pressure and pelvic floor muscle re-education
- e) **Interrupted Direct Current:** Introduction & characteristics, Parameters of stimulation, physiological and therapeutic uses of stimulation, precautions
- f) **Galvanic Current:** Introduction & characteristics, Parameters of stimulation, physiological and therapeutic uses of stimulation, precautions
- g) **Iontophoresis:** Definition, principles of iontophoresis, physiological and therapeutic uses, indications, techniques of iontophoresis, principles of treatment, contra-indications and dangers
- h) **TENS:** Definition, types, Theories of pain modulation emphasizing on "Pain gate" theory, techniques of treatment, indication and contra –indications

#### **2. MEDIUM FREQUENCY CURRENT**

- a) **Interferential current:** Definition, characteristics, physiological & therapeutic



- effects of Interferential current, techniques of application, indications, contra-indications and precautions
- b) **Bio-feedback:** Introduction, principles of Bio-feedback, therapeutic effects of bio-feedback, Indications and contra-indications, techniques of treatment
  - c) **Advanced Electrotherapy:** Computerization in electrotherapy, Programming of parameters of treatment, appropriate selections of parameters and combination therapy, Combination therapy-principles, therapeutic uses and indications like, Ultrasound therapy with stimulation or TENS etc.
  - d) Introduction to Russian current, Dia-dynamic current, HVPGS and Micro currents\*\*
  - e) Electrical currents for Care of the wound

### 3. HIGH FREQUENCY CURRENT

- a) **Short Wave Diathermy (SWD):** Introduction, physiological effects and Therapeutic effects of SWD, methods of application (capacitor field method and cable method etc.) Techniques of treatment, indication, contra-indications and dangers.
- b) **Pulsed SWD:** Definition, characteristics, mechanism of work, physiological effects and therapeutic effects, indications, techniques of application, principles of treatment and contra-indications
- c) **Ultrasonic Therapy:** Introduction and characteristics, Ultrasound Therapy parameters, coupling media, therapeutic effects, indications contra-indications and dangers, testing of apparatus, techniques of application & dosage, Phonophoresis
- d) **Electromagnetic waves:** Electromagnetic spectrum, physical properties of electromagnetic radiations-reflection, refraction, absorption penetration, Grothus' law, Cosine law, Inverse square law and its practical application
- e) Cellular bio-physics – reception and emission of electromagnetic signals Environmental currents and fields – risk factors on prolonged exposure to electromagnetic field
- f) **Infra Red Rays (IRR):** Production of infra red rays, luminous and non – luminous generators, penetration, technique of application, physiological effects and therapeutic uses of infra-red rays, duration and frequency of treatment, indications and contra indications, dangers and precautions.
- g) **Ultra Violet Rays( UVR):** Production of UVR, test dose, physiological effects of UVR dosimetry in UVR. PUVA
- h) **LASER:** Introduction and characteristics, effects on tissue, therapeutic effects, principles of application, indications, contra-indications and dangers
- i) **Microwave Diathermy (MWD):** Introduction and characteristics, physiological effects, therapeutics effects, techniques of application and principles of treatment, indications, contra-indications and dangers
- j) **Superficial heat modalities:** Structure of the apparatus, composition of wax and mineral oils physiological effects and therapeutic uses of wax bath, technique of application
- k) Other Heating Modalities: Heating pad, moist heat and fluid therapy
- l) **Cryotherapy:** Physiological effects and therapeutic uses of ice therapy, Techniques of application, contra – indication to ice treatment
- m) **Hydrotherapy:** Properties of water buoyancy, effects of buoyancy on movement, Hubbard tank, contrast bath, whirlpool bath
- n) **Care of the wound:** UVR, LASER and Ultrasound
- o) **Recent advances in Electro-physiotherapy:** High intensity laser, Shockwave, PEMF (Pulse Electro Magnetic Energy), Spinal Decompression, Pneumatic

Compression therapy, FES, virtual reality training.

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topics</b>
I (40 Marks)	Low & Medium frequency currents
II (40 Marks)	High frequency current



## **8. Miscellaneous Medicines**

### **8.1 RADIOLOGY**

(Not for University Exam)

#### **OBJECTIVES**

At the end of the course the candidate will be able to

1. Identify common chest conditions together with basic traumatic, infective, inflammatory and degenerative conditions and bony skeletal
2. Read CT, MRI of different joints.

#### **Syllabus**

1. Introduction to Radiology
2. Importance of Radiology in Physiotherapy
3. X-rays of fractures of different bones in the body
4. X-rays of different stages of fracture healing
5. X-rays of different Orthopedic conditions - Osteoarthritis, Rheumatoid arthritis
6. Cervical & lumbar spondylosis, foot deformities etc.
7. X-rays of common chest conditions
8. C.T Scan, M.R.I., Angiography, 3D reconstruction of bones & joints

### **8.2 ENT**

(Not for University Exam)

#### **OBJECTIVES:**

At the end of the course the candidate will be able to:

Identify common ear, nose, throat conditions together with basic traumatic, infective, inflammatory and degenerative conditions and skeletal, muscular or any other structural abnormalities

#### **SYLLABUS:**

1. **Anatomy & Physiology of Hearing:** Assessment & Management of Hearing Loss
2. **Introduction to Disease of ENT:** Otitis media, Sinusitis & Rhinitis
3. **Facial Nerve Palsy:** Causes & Management
4. **Larynx & Associated functional paralysis with tracheostomy & Care of tracheostomy**
5. **Vertigo:** Causes, Assessment & Management.

### **8.3 OPHTHALMOLOGY**

(Not for University Exam)

#### **OBJECTIVES:-**

At the end of the course, the students will be able to

1. Acquire knowledge of structure and function of the eye
2. Describe etiology, patho-physiology, sign and symptoms and clinical evaluation of common ophthalmic conditions related to Physiotherapy

#### **SYLLABUS:-**

1. Common eye diseases, including Refractory errors, conjunctivitis, and trachoma.
2. Cataract and glaucoma.
3. Squint and ptosis.
4. Eye lesions in leprosy, including causes treatment and complications of lagophthalmos.
5. Causes, clinical features and treatment of disorders of ocular movement occurring in diseases such as myasthenia gravis, progressive supranuclear palsy and lower motor

neuron diseases.

6. Causes, clinical features, treatment and prognosis in inflammatory disorders, vitamin A deficiency, emphasis on preventable causes and prophylactic measures.
7. Definition of blindness, and visual disability evaluation, investigative procedures used for testing visual failures.



## 9. ALLIED THERAPEUTICS (Basics only)

(Not for University exam)

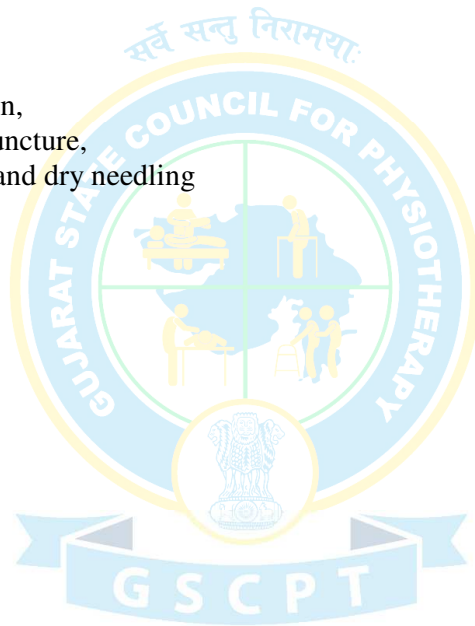
### **OBJECTIVES:-**

At the end of the course the candidate will be able to

1. Comprehend the use of various allied therapeutic sciences in health care delivery.

### **SYLLABUS:-**

1. Acupuncture and acupressure: definition, principles, techniques, physiological and therapeutic effects, contraindications and dangers
2. Introduction to Naturopathy
3. Magneto therapy
4. Yoga Sana -pranayama and their scientific study
5. Dry needling (DN)
  - a) Introduction,
  - b) General practice
  - c) Guidelines,
  - d) Safety,
  - e) Principles,
  - f) Hygiene,
  - g) Patient-skin preparation,
  - h) Correlation with acupuncture,
  - i) Electrical stimulation and dry needling



## **10. RECENT TRENDS (Not for exam)**

### **10.1 PROFESSIONAL PRACTICE & ETHICS**

#### **OBJECTIVES:**

At the end of the course the candidate will be able to:

1. Be able to understand the moral values and meaning of ethics
2. Acquire bedside manners and communication skills in relation with patients, peers seniors and other professionals.
3. Be able to develop psychomotor skills for physiotherapist patient relationship.
4. Skill to evaluate and make decision for plan of management based on sociocultural values and referral practice.
5. Be able to develop behavioral skills and humanitarian approach while communicating with patients, relatives, society at large and co-professionals
6. Be able to develop bedside behavior, respect & maintain patients' confidentiality.

#### **SYLLABUS:-**

1. Ethical code of concept
2. Communication skills
3. Physiotherapist-patient relationship
4. Interviews – Types of interview, skills of interviewing

### **10.2 EVIDENCE BASED PRACTICE & ICF**

#### **OBJECTIVES:-**

At the end of the course the candidate will be able to

1. Understand concept of Evidence Based Practice and its implementation in Physiotherapy
2. Search, review and use the evidences in Physiotherapy

#### **SYLLABUS:-**

##### **Introduction to Evidence Based Practice**

Definitions, Evidence Based Practice, Evidence Based Physiotherapy Practice

##### **Concepts of Evidence based Physiotherapy**

Awareness, consultation, judgment, creativity

##### **Development of Evidence based knowledge**

The individual professional, professionals within a discipline, professionals across disciplines

##### **Evidence Based Practitioner**

The reflective practitioner, the E model

## THIRD YEAR B. PHYSIOTHERAPY

### 1. GENERAL MEDICINE

#### **OBJECTIVES**

At the end of the course, the candidate will be able to

1. Acquire the knowledge of Etiology, Patho-physiology, signs and symptoms and management in brief, of the infectious diseases, diseases of metabolism especially obesity and other related medical conditions, diseases of hematopoietic system, diseases of GI and urinary tract & endocrine disorders
2. Describe etiology, patho-physiology, sign and symptoms, clinical evaluation and management of the various cardio-vascular and respiratory disorders with interpretation of investigations: chest x-ray, Echocardiography, blood gas analysis, blood investigations and pulmonary function test
3. acquire the knowledge of auto-immune & rheumatological conditions with special emphasis to those involving Musculoskeletal system and skin, with regards to etiology, pathophysiology, signs and symptoms, differential diagnosis and medical management of same

#### **SYLLABUS:-**

1. **Respiratory Diseases:** Lung function tests, pneumonia, ILD, Respiratory failure, pulmonary edema, pulmonary embolism lung abscess, bronchiectasis, asthma, emphysema, pleural effusion, Pneumothorax, empyema, chronic bronchiectasis,
2. **Cardio Vascular Diseases:** Rheumatic fever, valvular lesions, congestive cardiac failure, ischaemic heart diseases (Angina pectoris and myo-cardial infarction) stress test, hypertension, peripheral vascular-diseases (TAO, Raynauds disease).
3. **Endocrinal Disorders:** Diabetes mellitus, obesity, thyrotoxicosis, myxedema.
4. **Gastro-intestinal Disorders:** Peptic ulcer, pancreatitis, dysenteries and diarrhea, inflammatory bowel diseases, jaundice, cirrhosis of liver.
5. **Infectious Disease:** Tuberculosis, malaria, typhoid, infective hepatitis, tetanus.
6. **Nutritional Disorder:** Vitamins and its deficiencies, disorders including rickets and osteomalacia, anaemia.
7. **Urogenital System:** Structure and functions of kidneys including physiology of micturition, acute and chronic renal failure, glomerulo-nephritis, pyelonephritis.
8. **Rheumatology:** Rheumatoid arthritis, ankylosing spondylitis, gout, osteoarthritis, Spondyloarthritis, systemic lupus erythromatous, polyarteritis nodosa, mixed connective tissue disorders, scleroderma.

## 2. SKIN & V.D. (DERMATOLOGY)

### **OBJECTIVES:-**

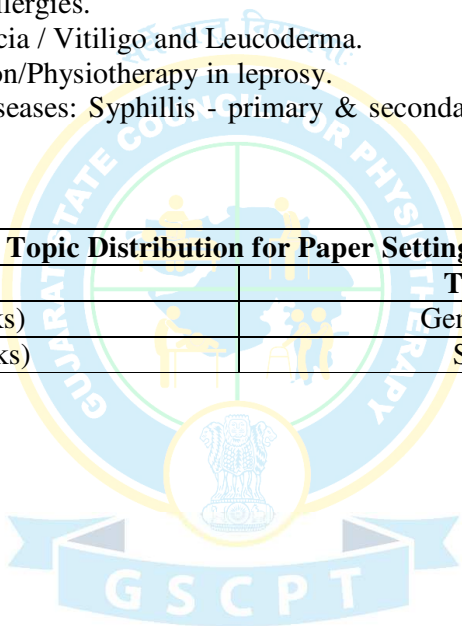
At the end of the course, the students will be able to

1. Acquire knowledge in structure and function of the skin and about various primary, secondary and special skin lesions related to systemic disorders
2. Describe etiology, clinical features and management of bacterial, fungal, viral, allergic, autoimmune skin diseases
3. Acquire knowledge in sexually transmitted diseases and leprosy.

### **SYLLABUS:-**

1. Structure and functions of normal skin, primary and secondary skin lesions.
2. Scabies and pediculosis.
3. Fungal infections of skin: Dermatophytosis, Pityriasisversicolor, Candidiasis.
4. Bacterial infections of skin-Impetigo / Boil.
5. Viral infections of skin-Herpes zoster.
6. Eczema / Dermatitis / Allergies.
7. Psoriasis / Acne / Alopecia / Vitiligo and Leucoderma.
8. Leprosy / Lepra - reaction/Physiotherapy in leprosy.
9. Sexually transmitted diseases: Syphillis - primary & secondary, Gonorrhoea, Chancroid, AIDS.

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topic Sr. No.</b>
I (55 Marks)	General Medicine
II (25 Marks)	Skin & V.D.





### **3. NEUROLOGY**

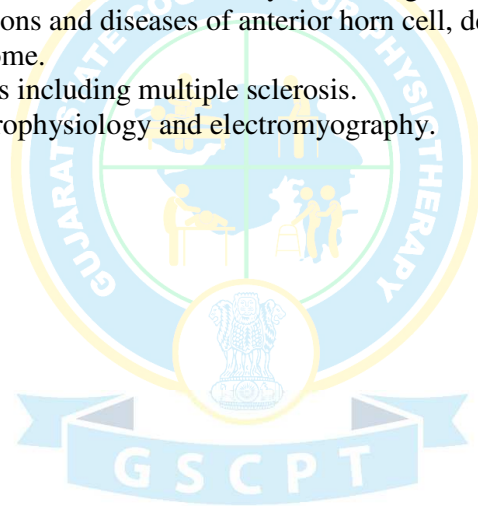
#### **OBJECTIVES:-**

At the end of the course, the candidate will be able to

1. Describe etiology, patho-physiology, sign and symptoms, clinical evaluation and management of the various neurological conditions with interpretation of laboratory & radiological investigations.

#### **SYLLABUS:-**

1. Anatomy, Physiology, Lesions and diseases of Pyramidal system, extra-pyramidal system, cerebellar system, spinal cord, upper and lower motor neuron, cranial nerves, brachial plexus, lumbosacral plexus and peripheral nerves.
2. Causes, Clinical features, and management of: Unconscious patient, hemiplegia, paraplegia, quadriplegia, cerebral diplegia, spastic child, foot drop and wrist drop.
3. Disorders of cerebral circulation.
4. Infections: Encephalitis, meningitis, poliomyelitis, transverse myelitis, slow viral diseases.
5. Diseases of Peripheral nerves: Peripheral neuropathy, other neuropathies.
6. Muscle disorders: Myopathy, polymyositis, Muscular dystrophies.
7. Degenerative diseases: Parkinsonism, myasthenia gravis motor neuron diseases, spinocerebellar degenerations and diseases of anterior horn cell, dementia.
8. Costo-clavicular syndrome.
9. Demyelinating disorders including multiple sclerosis.
10. Basic concept of electrophysiology and electromyography.
11. Giddiness and vertigo



#### **4. PAEDIATRICS**

##### **OBJECTIVES:-**

At the end of the course the candidate will be able to

1. Describe normal development and growth of a child, importance of immunization and breast feeding and psychological aspect of development
2. Describe neuro muscular, musculo skeletal and cardio pulmonary conditions related to immunological conditions, nutritional deficiencies, infectious disease and genetically transmitted conditions
3. Acquired skill of clinical examination of a neonate / child with respect to neurological, musculoskeletal and respiratory function.

##### **SYLLABUS:-**

1. Growth and development of a child from birth to 12 years, including physical, social, adaptive development.
2. The maternal and neonatal factors contributing to high risk pregnancy, the neonate, inherited diseases, maternal infections - viral and bacterial, maternal diseases incidental to pregnancy, induced hypertension, chronic maternal diseases such as heart diseases, renal failure, tuberculosis, diabetes, epilepsy, bleeding in the mother at any trimester.
3. Community programmes: International (WHO), national and local, for prevention of poliomyelitis, blindness, deafness, mental retardation and hypothyroidism, the immunization schedule for children.
4. Cerebral Palsy : Etiology - prenatal, perinatal and postnatal causes, pathogenesis, types of cerebral palsy (classification), findings on examination, general examination, examination of C.N.S., musculoskeletal system, respiratory system, G.I. Tract and nutritional status.
5. Associated defect-downs syndrome, Mental retardation, microcephaly, blindness, hearing and speech impairment, squint and convulsions.
6. Prevention - Appropriate management of high risk pregnancies, prevention of neonatal and postnatal infections, metabolic problems.
7. Muscular Dystrophy: Various forms, modes of inheritance and clinical manifestation, physical findings in relation to disabilities, progression of various forms and prognosis, treatment goals in forms which are not fatal.
8. Spina bifida, Meningocele : Development, clinical features - lower limbs, bladder and bowel complications - U.T.I. and hydrocephalus, medical management.
9. Still's Disease: Classification, pathology in brief, physical findings, course and prognosis, treatment, prevention and correction of deformity.
10. Acute C.N.S. infections, Classification (Bacterial and Viral), the acute illness, C.N.S. sequelae leading to mental retardation, blindness, deafness, speech defect, motor paralysis, bladder and bowel problems, seizure disorder and specific problems such as subdural effusion, hydrocephalus, pressure sores, feeding difficulties.
11. Normal diet of newborn and child: List dietary calorie, fat, Protein, mineral and vitamin requirement in normal child and in a child with malnutrition. childhood obesity. Etiology, findings, and treatment of rickets, vitamin D deficiency and resistant rickets
12. Lung infections: Clinical findings, complications and medical treatment of bronchiectasis, lung abscess and bronchial asthma.

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topic Sr. No.</b>
I (55 Marks)	Neurology
II (25 Marks)	Pediatrics

## **5. SURGERY**

### **5.1 GENERAL SURGERY & PLASTIC SURGERY & NEUROSURGERY**

#### **OBJECTIVES:-**

At the end of the course, the student will be able to

1. Describe the effects of surgical trauma and anesthesia in general
2. Classify, clinically evaluate and describe the surgical management in brief in
  - a) wounds-ulcers b) burns
3. Describe pre-operative evaluation, surgical indications and various surgical approaches in various abdominal conditions and peripheral vascular conditions
4. Recall the surgical approaches in the form of line diagram and will be able to describe the components of soft tissues cut to reach the target tissue, and the possible post-operative complications in movement
5. Clinically evaluate post-operative abdominal conditions with special reference to the cardio-vascular and pulmonary function, describe post-operative management in brief.
6. Describe the management of head injury, spinal surgeries, intracranial tumors, peripheral nerve lesions and pain

#### **SYLLABUS:-**

1. Acute infections, Inflammatory fever, bacteremia, septicemia, pyemia, toxemia. Specific types - Cellulitis - sites lymphangitis, abscess with special reference to hand infection, carbuncle.
2. Specific types cont'd: Tetanus, gas gangrene, hospital infection, cross infection with modes of spread and prevention, General survey of chronic inflammations, Syphilis (reference to other venereal diseases) leprosy, actinomycosis.
3. General survey of trauma, pathology and clinical features of wound repair - primary, secondary and tertiary wound healing, Clean wounds, contaminated wounds and infectious wounds, Principles of treatment, survey of factors affecting wound healing, Ulcers and gangrene, Post-operative complications of abdominal surgery specifically chest, wound infection, oedema.
4. Burns as a specific type of severe trauma, classification, early and late complications, management & reconstructive surgery - skin grafting as an example of plastic procedure.
5. Types of skin grafting - take of grafting - healing of grafting, Post operative care of plastic surgery with specific role of physiotherapy,
6. Outline of surgical disorders of brain - head injuries.  
General survey of surgical disorders of spine and spinal cord problem of paraplegia, malignancy - spread and its behavior, various abdominal incisions, abdominal drainage tubes, catheters and nasogastric tubes, ward demonstration for an hour a day for a period of one week.
7. Anesthesia, O.T. demonstrations.
8. Neck, skin contractures and correction.
9. Problems of trauma to hand and their management, Urinary tract infection.
10. Principles of cineplasty, tendon transplant, cosmetic surgery types of grafts, surgery of hands with emphasis on management of traumatic and leprosy hand.
11. Breast – surgery
12. NeuroPhysiology- Neurophysiology, basis of tone, disorders of tone and posture, bladder control, muscle contraction, movement and pain with clinical features and management of the following
  - a) Congenital and childhood disorders - hydrocephalus spina bifida

- b) Trauma - Broad localization, first aid and management of sequel of head injury and spinal cord injury.
- c) Diseases of the Spinal Cord - Craniovertebral junction anomalies, syringomyelia, cervical and lumbar disc disease, tumors.
- d) Peripheral nerve disorders - Peripheral nerve injuries, localization & management. Entrapment neuropathies.
- e) Intracranial tumors - Broad classification, signs and symptoms.
- f) Pre-operative Assessment and indications and contra - indication for neurosurgery in intracranial tumors
- g) Management of pain, electrical stimulation of brain and spinal cord.
- h) Miscellaneous.

**Clinical: Operation Theater ( O.T.) Visit**

**5.2 CARDIOTHORACIC SURGERY**

**OBJECTIVES:-**

At the end of the course, the student will be able to

1. Describe types of incision, pre and post-operative assessment and complications of Cardio-thoracic surgery and their management
2. Clinically evaluate post-operative cardio-vascular and pulmonary function status
4. Read and interpret investigations including findings of the x-ray chest, CT scan and MRI scan.

**SYLLABUS:-**

1. Basic anatomy of chest wall, trachea and bronchial tree, lungs and bronchopulmonary segments, pleura and mediastinum.
2. Physiology and mechanics of breathing and use of mechanical breathing - ventilator : (respirators).
3. Pulmonary function tests.
4. Investigation of lung diseases including endoscopies.
5. Chest injury.
6. Common suppurative diseases of lung - Bronchiectasis, lung abscess.
7. Bronchogenic carcinoma
8. Common surgeries of chest  
Thoracoplasty, pulmonary dissections, thoracotomy.  
Pneumothorax, hydrothorax-Pneumothorax, empyema.
9. Common diseases of oesophagus and related conditions causing dysphagia.
10. Surgery of portal hypertension.
11. Surgery of pulmonary tuberculosis.
12. Surgery of heart and great vessels.
13. Basic anatomy of heart, great vessels.
14. Investigation of patient undergoing cardiac surgery.
15. Cardiac arrest, its management.
16. Basic principles of open heart Surgery, Heart lung bypass (Extra Co-portal circulation)
17. Common diseases of heart requiring surgery both congenital and acquired including open heart surgery.
18. Common drugs used in cardiac surgery, its uses, side effects.
19. Common vascular surgery, Embolectomy, vascular reconstructive surgery, (Thrombosis, Embolism, atherosclerotic and occlusive vascular diseases including coronary artery

bypass)

**Clinical:**

1. Examination of patients as regards chest & heart diseases.
2. Demonstration - Acquaintances with C.T. Surgery,
3. Equipments, I.C.C.U.O.T.
4. Radiology - X-ray studies - X-ray chest in various lung diseases.



## 6. OBSTETRICS AND GYNAECOLOGY

### OBJECTIVES:-

At the end of the course, the student will be able to

1. Describe the normal and abnormal physiological events during the puberty, labor, puerperium, post-natal stage and menopause
2. Discuss various complications during pregnancy, labor, puerperium and postnatal stage, pre-andpost-menopausal stage and various aspects of urogenital dysfunction and the management in brief
3. Acquire knowledge in brief about intra uterine development of the fetus
4. Acquire the skill of clinical examination of the pelvic floor
5. Acquire the skill of the clinical examination of pregnant woman.

### SYLLABUS:-

1. Anatomy and physiology of the female reproductive organs. Puberty dynamics.
2. Physiology of menstrual cycle-ovulation cycle, uterine cycle Cx. cycle, Duration, amount.
3. Hormonal regulation of menstruation.
4. Diagnosis of pregnancy.
5. Abortion
6. Physiological changes during pregnancy.
7. Antenatal care.
8. High risk pregnancy.
9. Normal labour.
10. Normal puerperium and postnatal.
11. Family planning.
12. Medical Termination of pregnancy (MTP).
13. Infection of female genital tract including sexually transmitted diseases, low backache.
14. Prolapse of uterus and vagina.
15. Principles of common gynaec operations Hysterectomy
16. Menopause and its effects
17. Sterility.

**Clinical: Operation Theater ( O.T.) Visit**

Topic Distribution for Paper Setting	
Section	Topic Sr. No.
I (55 Marks)	Surgery (General Surgery, Plastic Surgery, Neurosurgery + Cardiothoracic Surgery)
II (25 Marks)	Obstetrics and Gynecology

## 7. PHYSICAL & FUNCTIONAL DIAGNOSIS

### **OBJECTIVES: -**

At the end of the course, the candidate will be able to

1. Describe the human development & maturation; with special emphasis to psychomotor development, maturation & alteration during aging process
2. acquire the skill of detection & objective documentation of the neurological, musculoskeletal, cardiovascular & pulmonary dysfunctions such as pain, altered muscle power, mobility, endurance, limb length, posture, gait, hand function & A.D.L. in adult & pediatric conditions & acquire skill & to arrive at the Functional diagnosis as per International Classification of Functioning (ICF)
3. Describe the physiology of nerve impulse, motor unit, its electro-physiological character and acquire the skill of performance and interpretation of various electro-diagnostic tests in the assessment of peripheral nerve lesions
4. Be able to do interpretation of common investigations used to arrive at the Physical & Functional diagnosis.

### **SYLLABUS:-**

#### **1. General principles of Human development & maturation**

- a) Aspects: physical, motor, sensory, cognitive, emotional, cultural, social
- b) Factors influencing human development & growth: Biological, environmental, inherited.
- c) Principles of maturation - in general - in anatomical directional pattern cephalo – caudal proximo – distal centro – lateral, mass to specific pattern, gross to fine motor development
- d) Reflex maturation tests
5. Development in specific fields: Oromotor development, sensory development, neurodevelopment of hand function

#### **2. Electro diagnosis**

- a) Bioelectricity-Physiology of generation & propagation of action potential, volume conduction
- b) Therapeutic current-as a tool for electro diagnosis
- c) Physiological principles, use of alternating & direct currents in electro-diagnosis such as sensory & Pain threshold, Pain tolerance,-Short & long pulse test, S.D. curves, Chronaxie&Rheobase, accommodation ratio,
- d) Principles of nerve conduction studies, late responses \*
- e) E.M.G. instrumentation, basic components, panel diagram, types of electrodes
- f) Principles of Electro- myography, motor unit –Normal characteristics-activity at rest, recruitment/frequency pattern at minimal activity, Interference pattern

#### **3. Assessment of Neurological dysfunction**

- a) Higher functions, cranial nerves, sensations & sensory organization, body image, tone, reflexes: superficial & deep, voluntary control, muscle strength, coordination, balance, posture, gait
- b) Scales: FRT, Berg's Balance, modified Ashworth, Glasgow Coma, TUG, FIM
- c) Functional diagnosis using ICF
- d) Interpretation of electro diagnostic findings, routine biochemical investigations

#### **4. Assessment of Musculoskeletal Dysfunction**

- a) Tightness, deformity, joint mobility, muscle strength, limb length, trick movement, girth, posture, gait, special tests
- b) Functional diagnosis using ICF
- c) Interpretation of X-ray of extremities & spine, routine bio-chemical investigations, CT

scan, MRI

- d) Assessment of pelvic floor muscle strength and function i. Digital evaluation of vagina ii. Perineometer iii. Pad test
- e) Disability Evaluation – gait and gait parameters, percentage of disability ( temporary and permanent )

**5. Assessment of cardio -pulmonary dysfunction**

- a) Vital parameters, chest expansion, chest excursion, breath holding test, breath sounds, rate of perceived exertion (RPE), peak flow rate
- b) Exercise Tolerance: six minutes' walk test, shuttle test, theoretical bases of Bruce's protocol, step test
- c) Ankle Brachial Index, tests for peripheral arterial & venous circulation
- d) Functional diagnosis using ICF
- e) Interpretation of X-ray chest, routine bio-chemical investigations, ABG, PFT, ECG (normal values)

**6. Assessment of pain**

- a) Intensity & quality
- b) Objective assessment & documentation: VAS, Numerical Rating Scale. Other scales

**7. Assessment of Hand**

- a) Sensations, mobility of joints, strength
- b) Special tests
- c) Hand function: Precision & power grips

**8. Assessment of Obesity**

- a) Classification
- b) Assessment – BMI, Waist circumference, Waist – Hip ratio
- c) Introduction to Quality of Life Questionnaire

**9. Assessment of wounds.**

**PRACTICALS:** Skills to be practiced on peer/model

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topic Sr. No.</b>
I (40 Marks)	1-4
II (40 Marks)	5-9

**8. ORTHOPADICS**

**8.1 ORTHOPADICS (TRAUMATIC)**

**OBJECTIVES**

At the end of the course, the student will be able to

1. Discuss the clinical manifestations and conservative/surgical management of various



- traumatic and cold cases of the musculo-skeletal conditions
2. Traumatic including both operative and non-operative
  3. Gain the skill of clinical examination and interpretation of the preoperative cases and all the post-operative cases
  4. Read and interpret salient features of the x-ray of the spine and extremities, and correlate the radiological findings with the clinical findings.

## Syllabus

1. **Introduction:** Fracture, dislocation and injuries of the upper limb. Briefly mention general principles of Orthopedic surgery, definition and scope, brief history
2. **Fracture & dislocations:** Causes, types, mechanisms, displacement, general symptoms, healing, principles of treatment, complications, malunion, delayed union, non-union, myositis ossificans, Volkman's ischemic contracture, Fat embolism, Sudeck's osteodystrophy
3. **Injuries to the hand:** Types (open, closed), principles of treatment, injuries to the phalanges, sprains, dislocations of MP & IP joints, fractures of the phalanges, metacarpals, Bennet's fracture, mallet finger, tendon injuries (flexor & extensor)
4. **Wrist & Forearm injuries:** Wrist dislocation, Colle's fracture, displaced epiphysis, Smith's fracture, Barton's fracture, injuries to carpal, scaphoid and sprains, fractures of forearm bones – greenstick fracture. Intrafracture injury, both bone fracture, Galeazzi, Monteggia fracture dislocation
5. **Injuries to the elbow:** Traumatic synovitis, sprain, dislocation of elbow joint
6. **Fractures involving elbow joint:** Supracondylar fracture, intercondylar fracture, fracture medial epicondyle, fracture of lateral condyle, myositis ossificans, Volkman's ischaemic contracture, fracture of the head of the radius, fracture of olecranon
7. **Injuries of shoulder and arm:** Fractures of the proximal end, neck and shaft of humerus, fractures of clavicle, acromioclavicular and sternoclavicular dislocations, fractures of the scapula
8. **Injuries of the spine:** Injuries to the cervical spine (Both upper and lower), atlanto-axial injuries  
Dorso Lumbar spine: classification, mechanism and types of injuries, stable fracture without paraplegia, fracture dislocation with paraplegia, management of fracture, management of paraplegia, bedsores and bladder care
9. **Injuries of the pelvis:** Fractures, its mechanism, classification, management, Fractures of acetabulum, sacrum and coccyx
10. **Injuries of the lower limb:** Dislocations of the hip joint, intracapsular and trochanteric fractures of femur, fractures of the neck of femur, fracture of the shaft of femur, fracture femur in children  
Fracture of femoral condyles, tibial condyles and patella. Injuries to extensor mechanism, contusion, haemarthrosis, knee joint dislocation and traumatic dislocation of patella  
Fracture and fracture dislocation of ankle, epiphyseal injury lower end of tibia Foot-fracture of talus, calcaneum, metatarsals and phalanges
11. **Soft tissue injuries:** Ligamentous injuries of ankle, knee and injury to Muscles. Orthopaedic splints and appliances for injuries to muscles and tendons
12. **Tendon transfer:** Principles, indications, common tendon transfer surgeries
13. **Amputation :** Types, site, ideal stump, complications, general principles of treatment Upper extremity and lower extremity amputations – prosthesis and prosthetic

service

Principles of operative management, indications and contraindications for arthroplasty, osteotomy, arthrodesis, spinal stabilization, arthroscopy

14. **Limb reattachment:** Principles, indications, technique.

**Clinical: Operation Theater ( O.T.) Visit**

## 8.2 ORTHOPADICS (NON-TRAUMATIC)

### OBJECTIVES

At the end of the course, the student will be able to

1. Discuss the patho-physiology, clinical manifestations and conservative/surgical management of various non-traumatic cases of the musculo-skeletal conditions
2. Non-traumatic including both operative and non-operative
3. Gain the skill of clinical examination and interpretation of the preoperative cases
4. Read and interpret pathological / biochemical studies pertaining to orthopedic conditions and correlate the radiological findings with the clinical findings

### SYLLABUS

#### 1. General Orthopedics

- a) Clinical examination of an orthopedic patient, investigations, radiological and imaging techniques (salient features)
- b) Deformities, acquired deformities, causes and principles of management, splinting
- c) Traction: procedures, materials
- d) Preventive orthopedics
- e) Geriatric orthopedics

#### 2. Congenital disorders

- a) Torticollis , wry neck, kyphosis, lordosis, scoliosis, spina bifida, myelomeningocele , congenital dislocation of hip, congenital genu recurvatum, talipesquinovarus
- b) Elevation of scapula, madelung's deformity, coxavara
- c) Endocranialdystosis, superior radio-ulna dysostosis, sternocleido mastoid tumor

#### 3. Infection of bones & joints

- a) Osteomyelitis (acute and chronic), Brody's abscess as a complication of open fracture
- b) Skeletal tuberculosis, principles of treatment, T.B. of shoulder, elbow and wrist T.B. of hip, knee ankle, and foot
- c) Dactylitis, caries rib

#### 4. Arthritis

- a) Acute pyogenic arthritis, septic arthritis of infancy, small pox arthritis, Syphilic infection of joint, Rheumatoid arthritis, osteoarthritis

#### 5. Bone tumors

- a) Classification, true bone tumors- osteosarcoma, giant cell tumor, Ewing's sarcoma, chondroblastoma, chondrosarcoma, fibrosarcoma, lymphoma of bone, plasmacytoma
- b) Bone metastasis: synovial sarcoma, hemangioma of bone, adamanatinoma of long bones and chondroma
- c) Tumor like lesions: osteoid osteoma, benign osteoblastoma, non osteogenic fibroma, osteoma, osteochondroma and enchondroma

#### 6. Neurological and Muscular disorders

- a) Definition, causes, clinical feature, complications, management (Multidisciplinary approach) medical and surgical of the following conditions: Cerebral palsy, Poliomyelitis, Leprosy

- b) Muscular dystrophy – types and treatment
- c) Injuries to plexus and nerves: Radial, Ulnar, Median, Brachial plexus, Sciatic and Lateral Popliteal

**7. Regional conditions of Spine and Lower limb**

- a) Back: Kyphosis, Scoliosis, Spondylolisthesis, Lumbosacral strain, intervertebral disc prolapse, fibrositis back, Lumbar canal stenosis, sacro iliac strain, spondylosis, spondylolysis
- b) Hip: Slipped capital femoral epiphysis, idiopathic chondrolysis of hip
- c) Knee: Genu valgum, genu varum, tibia varum, genu recurvatum, quadriceps fibrosis, recurrent dislocation of patella, bursa around the knee, loose bodies in the knee, chondromalacia patella
- d) Foot: Painful heel, Plantar fasciitis, Posterior heel pain, flat foot, foot strain, pain in forefoot, Hallux valgus, anterior metatarsalgia

**8. Regional conditions of Neck and Upper limb**

- a) Neck: Cervical spondylosis, intervertebral disc prolapse, Cervical rib, torticollis, Brachialgia
- b) Shoulder: Supraspinatus tendinitis, calcification, rupture of rotator cuff, periarthrits shoulder, deltoid fibrosis, subarachnoid bursitis, Bicepital tendinitis
- c) Elbow: Tennis elbow, Golfers elbow, recurrent slipping of ulnar nerve, cubitusvarus and valgus
- d) Wrist and Hand: Ganglion, De quervains disease, trigger finger, trigger thumb, carpal tunnel syndrome and Dupuytren’s contracture
- e) Miscellaneous: metabolic disease, rickets, osteomalacia, osteoporosis, parathyroid osteodystrophy, scurvy etc.

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topics</b>
I (40 Marks)	Orthopedic (Traumatic)
II (40 Marks)	Orthopedic (Non-Traumatic)

## 9. PREVENTIVE & SOCIAL MEDICINE

### **OBJECTIVES:-**

At the end of the course the candidate will be able to

1. Describe the concept of health and diseases, natural history of diseases
2. Describe the health administration at various levels (centre and state), health care delivery at urban and rural areas
3. Describe the health problems of vulnerable groups and national health Programmes
4. Explain principles and philosophy of health education and health education tools
5. Describe the role of various health agencies, ngos at international and national level
6. Identify occupational health hazards and its management

### **SYLLABUS:-**

1. **General concept of health & disease**  
With reference to natural history of disease with pre-pathology phase
2. **The role of social economics in communities**
3. **Epidemiology and scope**
4. **Public health administration**  
Overall view of the health administration setup and central and state levels. Health care delivery programs in urban and rural areas, health and population statistics
5. **The national health programs**  
Highlighting the role of social, economic and cultural factors in the implementation of the national programs
6. **Health problems of vulnerable groups**  
Pregnant and lactating women, infants and pre-school children, occupational groups and geriatrics
7. **Occupational health**
  - a) Definition, scope, occupational diseases and hazards
  - b) Social security and other measures for the protection from occupational hazards, accidents and diseases
8. **Family planning**
  - a) Objectives of national family planning programs and family planning methods
  - b) General idea of advantages and disadvantages of methods
9. **Mental health**  
Community aspects of mental health: role of physiotherapists / therapists in mental health problems such as mental retardation
10. **Nutrition and Health**  
Classification of foods, nutritional profiles of principal foods, nutritional problems in public health, community nutrition programmes
11. **Environment and Health**  
Components of environment, water and air pollution and public health: Pollution control, disposal of waste, medical entomology
12. **Communicable diseases**
13. An overall view of communicable diseases classified according to principal mode of transmission. Role of insects and other vectors

14. **International health agencies**
15. **Principles and process of communication**
16. **IEC (Information Education and Communication)**
17. **Health education**
  - a) Philosophy, main principles and objectives
  - b) Methods and tools of health education individual and group methods
  - c) The role of profession in health education
  - d) Role of other personal in health education, co-ordination and co-operation, health education with other members of the health team
  - e) Elements of planning health education programmes
18. **Hospital waste management**

Sources of hospital waste, health hazards, waste management
19. **Disaster Management**

Natural and manmade disasters, disaster impact and response, relief phase, epidemiologic surveillance and disease control, nutrition, rehabilitation, disaster preparedness.



## 10. RECENT TRENDS (Not for University exam)

### 10.1 PROFESSIONAL PRACTICE & ETHICS

#### OBJECTIVES:

At the end of the course the candidate will be able to:

1. Be able to understand the moral values and meaning of ethics
2. Acquire bedside manners and communication skills in relation with patients, peers seniors and other professionals.
3. Be able to develop psychomotor skills for physiotherapist patient relationship.
4. Skill to evaluate and make decision for plan of management based on sociocultural values and referral practice.
5. Be able to develop behavioral skills and humanitarian approach while communicating with patients, relatives, society at large and co-professionals
6. Be able to develop bedside behavior, respect & maintain patients' confidentiality.

#### SYLLABUS:-

1. Collecting data on psychosocial factors in Medicine/Surgery/Reproductive Health/Pediatrics
2. Inter professional communication
3. Ethics in clinical practice

### 10.2 EVIDENCE BASED PRACTICE & ICF

#### OBJECTIVES:-

At the end of the course the candidate will be able to

1. Understand concept of Evidence Based Practice and its implementation in Physiotherapy
2. Search, review and use the evidences in Physiotherapy

#### SYLLABUS:-

##### **Finding the Evidence**

Measuring outcomes in Evidence Based Practice, measuring health outcomes, measuring clinical outcomes, inferential statistics and causation

##### **Searching for the Evidence**

Asking questions, identifying different sources of evidence

##### **Assessing the Evidence**

Evaluating the evidence; levels of evidence in research using quantitative methods, levels of evidence classification system, outcome measurements, biostatistics, the critical review of research using qualitative methods

##### **Systematically reviewing the evidence**

Stages of systematic reviews, Meta analysis, the Cochrane collaboration

##### **Using the evidence**

Building evidence in practice, critically appraised topics (CATs)

##### **International Classification of Function, Disability and Handicap**

## FINAL YEAR B. PHYSIOTHERAPY

### FINAL YEAR B. PHYSIOTHERAPY

#### **1. PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS**

##### **OBJECTIVES:-**

At the end of the course candidate will be able to

1. Acquire the knowledge of normal neurodevelopment with specific reference to locomotion.
2. Assess, identify and analyze neuro motor and psychosomatic dysfunction in terms of alteration in the muscle tone, power, coordination, involuntary movements, sensations, perceptions etc.
3. Correlate the assessment findings with provisional diagnosis and investigations such as EMG/NCS and arrive at Physical and functional diagnosis with clinical reasoning in various neuromuscular disorders.
4. Plan, prescribe and execute short term and long term treatment with special reference to relief of neuropathic and psychosomatic pain and use of various physiotherapeutic techniques/ modalities, including ergonomic advice and parent education in neuro pediatric cases.
5. Prescribe appropriate orthoses/splints and fabricate temporary protective and functional splints.

##### **SYLLABUS:-**

1. Review of basic neuro anatomy and physiology
2. Physiotherapy techniques to improve tone, voluntary control, co-ordination
3. Neuro physiotherapeutic Techniques: Concepts, principles, techniques and effects of: NDT, PNF, Brunnstrom movement therapy, Vojta therapy, Rood's sensory motor approach, Contemporary task oriented approach.
4. Application of skills as PNF, co-ordination, functional re- education, balancing exercise by using techniques based on neuro physiological principles.
5. Tools used for neuro rehabilitation like vestibular balls, tilt board etc.
6. Application of transfer, functional re-education exercises & gait training
7. Bladder training.
8. Developing a philosophy for caring.
9. Prescription of appropriate orthotic devices & fabrication of temporary splints.
10. Lifting techniques, wheel chair modifications, adaptive devices.
11. Ergonomic advice for prevention/rehabilitation to the patients / parents /caregivers
12. Education about handling of a patient.
13. **Pediatric Neuro-physiotherapy**  
Use of various Neurophysiological approaches & modalities in high risk babies, minimum brain damage, developmental disorders, Cerebral palsy, Down's syndrome, Hydrocephalus, Spina bifida
14. **Assessment & management of brain Disorders**  
Stroke, Meningitis, Encephalitis, Head Injury, Parkinson's disease, parkinsonism syndromes, Multiple sclerosis, Brain tumors
15. **Assessment & management of spinal cord lesions and bladder dysfunction**  
Multiple sclerosis, transverse myelitis, Poliomyelitis/PPRP, syringomyelia, spinal cord injury and sub acute combined degeneration of spinal cord, Motor neuron disease (ALS, SMA and other types), spinal tumors
16. **Assessment & Management of Co-ordination Disorders**

- Ataxia, Friedriech's ataxia, Cerebellar ataxia, Sensory ataxia
17. **Assessment & Management of Muscle Disorders**  
Muscular dystrophy (DMD) & other myopathies
  18. **Assessment & Management of disorders of neuromuscular junction**  
Myasthenia Gravis
  19. **Assessment & management of neuropathies and nerve injuries**  
Emphasis on 5th, 7th and 8th cranial nerves, Peripheral nerves, Polyneuropathy –  
Classification of Polyneuropathies
  20. **Pre and post-surgical assessment & management in neuro surgery**  
Hydrocephalus and myelomeningocele, C.V. junction anomalies, syringomyelia
  21. **Electro diagnostic procedures and prognosis in neurological disorders**  
SD curves, EMG & NCS.

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topic Sr. No.</b>
I (40 Marks)	1-15
II (40 Marks)	16-21





## 2. PHYSIOTHERAPY IN MUSCULO-SKELETAL CONDITIONS

### **OBJECTIVES:-**

At the end of the course the candidate will be able to

1. Identify, discuss and analyze the musculoskeletal dysfunction in terms of biomechanical, kinesiological and biophysical basis and correlate the same with the provisional diagnosis, routine radiological and electro physiological investigations and arrive at appropriate physical and functional diagnosis with clinical reasoning
2. Describe as well as acquire the skill of executing short and long term physiotherapy treatment by selecting appropriate modes of mobilization/ manipulation, electrotherapy, therapeutic exercise and appropriate ergonomic advice for the relief of pain, restoration / maintenance of function & / or rehabilitation for maximum functional independence in ADLs at home & workplace
3. Understand the nature of sports injuries, able to evaluate and treat sports injuries, understand the role of physiotherapist in training and rehabilitating a sports person
4. Prescribe appropriate walking aids, orthoses and prosthesis

### **SYLLABUS:-**

Anatomy of bones and soft tissues (musculoskeletal system)

1. Evaluation, interpretation of investigations & functional diagnosis (ICF) with appropriate clinical reasoning for planning & implementation of management techniques
2. Planning, Prescription & Implementation of short term & long term goals with clinical reasoning
3. Documentation
4. Different physiotherapeutic techniques for functional restoration/ maintenance and prevention of disability
5. Different electro therapeutic techniques for relief of acute and chronic pain, swelling, wound healing, re-education with clinical reasoning
6. Different physiotherapeutic techniques to improve/maintain muscle performance
7. Different physiotherapeutic techniques to increase joint mobility.
8. Different physiotherapeutic strategies for correction / maintenance of good posture
9. Different physiotherapeutic strategies to improve efficiency and safety of gait pattern
10. Prescription of appropriate orthotic & prosthetic devices & fabrication of simple temporary splints.
11. Appropriate Home Program & Ergonomic advice for preventive measures & Functional efficiency at home & work place
12. **Physiotherapy approach in traumatology**  
Definition of fracture, classification of fracture, signs and symptoms of fracture, healing process of fracture, factors affecting healing, methods of reduction, complications of fracture
13. **Physiotherapy assessment in fracture cases**  
Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period  
Physiotherapy assessment and management of upper limb fractures and dislocations, lower limb fractures and dislocations including pelvis and spinal fractures
14. **Physiotherapy assessment & management of soft tissue injury**  
Contusion, sprains, strains, ruptures
15. **Physiotherapy assessment & management of degenerative conditions**  
Osteoarthritis (OA) with emphasize on Knee, Hip and Hand cervical spondylosis, lumbar spondylosis

- 16. Physiotherapy assessment & management of inflammatory conditions**  
Rheumatoid arthritis (RA), ankylosing spondylitis (AS), Still's disease, gout, peri-arthritis, bursitis, synovitis, capsulitis, tendinitis, tenosynovitis, fasciitis, Osgood Schlatter disease
- 17. Physiotherapy assessment and management of infective Conditions**  
Tuberculosis (TB) of spine and other major joints, osteomyelitis, pyogenic arthritis, septic arthritis
- 18. Physiotherapy assessment & management of congenital and acquired deformities**  
Congenital - CTEV, CDH, Torticollis, pesplanus, pescavus, Sprengel's scapula, Madelung's deformity  
Acquired: scoliosis, kyphosis, coxavara, genu varum, valgum and recurvatum, wry neck
- 19. Physiotherapy assessment & management of spinal conditions**  
Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Intervertebral disc prolapse, Sacro-iliac joint dysfunction, Coccydynia Sacralisation, Lumbarisation, Spina bifida occulta
- 20. Physiotherapy assessment & management of amputations**  
Definition, indications, types, levels of amputation of lower and upper extremities, pre and post operative assessment and management with emphasize on stump care and bandaging, pre and post prosthetic training and complete rehabilitation
- 21. Rehabilitation of patient with orthopedic surgery**  
Pre and post operative management of arthroplasty of all major joints, girdle stonearthroplasty , arthrodesis, arthroscopy, oosteotomy Reattachment of limb
- 22. Physiotherapy assessment & management of re-constructive surgery**  
Cerebral Palsy, poliomyelitis, leprosy
- 23. Physiotherapy assessment & management of hand injury**
- 24. Physiotherapy assessment & management of metabolic and hormonal disorders of the bone tissue**  
Osteoporosis, rickets, osteomalacia
- 25. Physiotherapy assessment & management of miscellaneous orthopedic conditions**  
Mallet finger, trigger finger, Dequerian's disease, metatarsalgia, hallux valgus, Dupuytren's contracture, thoracic outlet syndrome, chondromalacia patellae, ganglion, tennis elbow, plantar fasciitis
- 26. Sports Medicine**  
Introduction & classification of sports injury  
Aetiological factors  
Prevention of sports injury  
Frequency and site of injury  
Investigation and assessment in sports injury
- 27. Management of sports injuries**  
Pharmacology in sports  
Rehabilitation in sports

Topic Distribution for Paper Setting	
Section	Topic Sr. No.
I (40 Marks)	1-20
II (40 Marks)	21-27

### **3. PHYSIOTHERAPY IN CARDIO RESPIRATORY & MEDICAL SURGICAL CONDITIONS**

#### **3.1 PHYSIOTHERAPY IN CARDIO-PULMONARY CONDITIONS**

##### **OBJECTIVES:-**

At the end of the course candidate will be able to

1. Identify, discuss and analyze cardio vascular and pulmonary dysfunction based on pathophysiological principles and arrive at the appropriate physical and functional diagnosis.
2. Select strategies for cure, care and prevention to adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, work place and in community
3. Execute the effective physiotherapeutic measures (with appropriate clinical reasoning) with special emphasis to breathing retraining, nebulization, humidification, bronchial hygiene, general mobilization and exercise conditioning in general medical and surgical conditions
4. Acquire knowledge of the overview of patients care at the intensive care area, artificial ventilation, suctioning, positioning for bronchial hygiene and continuous monitoring of the patient at the intensive care area
5. Acquire the skill of evaluation and interpretation of functional capacity using simple exercise tolerance tests, symptom limited tests
6. Acquire the skill of basic cardiopulmonary resuscitation

##### **SYLLABUS:-**

- 1) **Anatomy and physiology of respiratory & cardiac system**  
Anatomy of thorax, biomechanics of thoracic cage, muscles of respiration, ventilation perfusion matching /mismatching, compliance
- 2) **Investigations and tests**  
Sub maximal /maximal exercise tolerance testing, Cardiac & Pulmonary radiographs, PFT, ABG, ECG, hematological and biochemical Tests
- 3) **Physiotherapy techniques to increase lung volume**  
Positioning, breathing exercises, Neurophysiological facilitation of respiration, mechanical aids - Incentive spirometry, CPAP, IPPB
- 4) **Physiotherapy techniques to decrease the work of breathing**  
Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids: IPPB, CPAP, BIPAP
- 5) **Physiotherapy techniques to clear secretions**  
Hydration, Humidification & Nebulization, Mobilization and breathing exercises, postural drainage, Manual techniques: Percussion, vibration and shaking, ACBT, Autogenic Drainage, Mechanical aids: PEP, Flutter, IPPB, facilitation of cough and huff, suctioning
- 6) **Physiotherapy in common complications following surgery And Drug therapy**  
Drugs to prevent and treat inflammation, drugs to treat bronchospasm, drugs to treat breathlessness, drugs to help sputum clearance, drugs to inhibit coughing, drugs to improve ventilation, drugs to reduce pulmonary hypertension, drug delivery doses, inhalers and nebulizers
- 7) **Introduction to ICU & mechanical ventilator**  
ICU monitoring – apparatus, airways and tubes used in the ICU - Physiotherapy in the ICU – common conditions in the ICU. Mechanical ventilator: types, modes of ventilator,

- advantages and disadvantages Oxygen therapy, CPR, aseptic precautions
- 8) **Physiotherapy assessment & management techniques in Obstructive lung conditions**  
Chronic bronchitis, emphysema, asthma, bronchiectasis, cystic fibrosis
  - 9) **Physiotherapy assessment & management techniques in Restrictive lung conditions**  
Rib fracture, Pleural effusion, pleurisy and empyema, pulmonary embolism, pulmonary tuberculosis, atelectasis, pneumothorax, bronchopulmonary fistula, pneumonia, ARDS
  - 10) **Physiotherapy following Lung surgeries**  
Pre and post operative physiotherapy assessment and management in Lobectomy, Pneumonectomy, decortication, thoracoplasty
  - 11) **Pulmonary Rehabilitation**  
Definition, aims and objectives, team members, benefits, principles of exercise prescription and techniques of rehabilitation
  - 12) **Anatomy and physiology of cardiovascular system**  
Anatomy, blood supply and conduction system of heart
  - 13) **Physiotherapy assessment & management for cardiovascular disorders**  
Cardiovascular disease, congestive heart failure, myocardial infarction, valvular diseases of heart, cyanotic and acyanotic congenital heart diseases, endocarditis
  - 14) **Cardiac Rehabilitation**  
Definition, aims and objectives, team members, benefits, principles of Exercise prescription and techniques of rehabilitation
  - 15) **Physiotherapy assessment & management of vascular diseases**  
Venous: Thrombosis, phlebitis and phlebo-thrombosis, varicose veins, DVT, venous Ulcers  
Arterial: Berger's disease, acute and chronic arterial occlusion, lymphedema

### 3.2 PHYSIOTHERAPY IN GENERAL MEDICAL-SURGICAL CONDITIONS

#### OBJECTIVES:-

1. Acquire knowledge of rationale of basic investigative approaches in the medical system and surgical intervention regimes related to cardio vascular and pulmonary impairment
2. Select strategies for cure, care and prevention to adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, work place and in community
3. Acquire the knowledge of evaluation and physiotherapy treatment for obstetrics and gynecological surgical conditions
4. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (psychiatry, dermatology and ENT conditions)
5. Assess the various degrees of burns, plan and implement physiotherapy techniques for the rehabilitation of a burn and wound patient.

#### 1) **Physiotherapy assessment & management for abdominal surgeries**

surgeries on upper gastro- intestinal tract - oesophagus- stomach- duodenum, surgery on large and small intestine – apendicectomy, cholecystectomy, partial colectomy, illieostomy, nephrectomy .

Hernia: herniotomy, herniorraphy, hernioplasty

#### 2) **Physiotherapy Assessment & management in onco surgeries**

Mastectomy: simple, radical .Hysterectomy, prostatectomy, neck dissection

#### 3) **Physiotherapy in obstetrics and gynecology surgeries**

Electrotherapy and exercise therapy measures following pelvic repair and caesarean section.

**4) Wounds, local infections, ulcers, pressure sores**

UVR and other electrotherapeutic modalities for healing of wound, prevention of hypergranulated scars, relief of pain and mobilization

**5) Physiotherapy in burns, skin grafts and re-constructive plastic surgery**

**6) Physiotherapy in ENT conditions**

Nonsuppurative otitis media, chronic suppurative otitis media, otosclerosis, labyrinthitis and mastoidectomy resulting into facial palsy, laryngectomy, pharyngo – laryngectomy, tracheostomy and its care, sinusitis

**7) Physiotherapy in skin conditions**

Leprosy, acne, alopecia, psoriasis, syphilis

**8) Physiotherapy in psychiatric conditions**

Schizophrenia, depression, psychosis, anxiety

**9) Emergency Care**

Basic Life Support, First aid & emergency care, Biomedical waste management

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topics</b>
I (55 marks)	Cardiorespiratory conditions
II (25 marks)	Medical surgical conditions



## 4. COMMUNITY PHYSIOTHERAPY REHABILITATION AND ASSISTIVE TECHNOLOGIES

### 4.1 COMMUNITY PHYSIOTHERAPY REHABILITATION

#### OBJECTIVES:-

At the end of the course, the candidate will be able to

1. Describe the general concepts about Health, Disease & Physical fitness
2. Describe policies for the rehabilitation of disabled and Role of Council to promote physiotherapy as a health delivery system
3. Describe the strategies to assess prevalence & incidence of various conditions responsible for increasing morbidity in the specific community, role of physiotherapy in reducing morbidity, expected clinical & functional recovery, reasons for non-compliance in specific community & environmental solution for the same
4. Describe the evaluation of disability & planning for prevention & rehabilitation
5. Describe CBR in urban & rural set up, WHO policies, concept of team work, role of multi- purpose health worker
6. Identify with clinical reasoning the prevailing contextual (environmental & psychosocial, cultural) factors, causing high risk, responsible for various dysfunctions & morbidity related to lifestyle & specific community like women, aged, industrial workers & describe planning strategies of interventional policies to combat such problems.

#### SYLLABUS:-

##### 1) Concepts of community health

Preventive, promotive, restorative and rehabilitative  
WHO definition of health and disease  
Health delivery system - 3 tier

##### 2) Disability types

Physical & Psychological Evaluation, prevention & Legislation related to Persons with Disability (PWD)

##### 3) CBR

Definition, principles, types (institutional, reach out and community), concepts, WHO policies

Principles of Team work of medical practitioner, Physiotherapist, Occupational Therapist, Speech & Audiology Therapist, Prosthetist & Orthotist, Clinical psychologist, vocational counselor and social worker. Role of Physiotherapy in team, concept of multipurpose health worker, role of Physiotherapy and strategies in 3 tier Health delivery system, communication strategies.

##### 4) Health Care

- a) Prevention, Promotion & Restoration
- b) In peri-pubertal age group
- c) In women-pregnancy and menopause
- d) In Geriatrics- neuromusculoskeletal, cardiovascular, pulmonary, metabolic and degenerative conditions
- e) In Obese / over weight
- f) In Cardiovascular and Pulmonary conditions
- g) In Diabetes
- h) Health promotion for all

##### 5) Women and child care

- a) Antenatal exercises, Specific Breathing exercises, Relaxation, Postural training, Pelvic floor strengthening exercises with clinical reasoning
- b) Physiotherapy during labor

- c) Postnatal exercises program after normal labor / labor with invasive procedures with clinical reasoning
- d) Menopause - Osteoporosis, Mental health, Physiotherapy management
- e) Preterm babies
- f) Adolescent age group
- g) Nutritional disorders in women and children
- 6) Geriatrics**  
Physiology of aging, environmental changes and adaptations, balance and falls  
Role of Physiotherapy in geriatric population.
- 7) Physical fitness**  
Energy system, Endurance, Aerobic Exercise, pacing of activity.
- 8) Ergonomics**
- 9) IQ Testing**

#### 4.2 REHABILITATION AND ASSISTIVE TECHNOLOGIES

##### OBJECTIVES:-

At the end of the course, the candidate will be able to

1. Acquire knowledge about biomechanical principles of application of variety of aids & appliances used for ambulation, protection & prevention
2. Acquire in brief knowledge about various materials used for splints/Orthosis& Prostheses and selection criteria for splints/Orthosis& Prostheses
3. Acquire the skill of fabrication of simple splints made out of low cost material.

##### SYLLABUS:-

1. Introduction and terminology: prosthesis and orthosis
2. Classification of orthosis and prostheses
3. Bio-mechanical principles of orthotic application
4. Bio-mechanical principles of prosthetic application
5. Orthotic appliances for Hip, Knee, Ankle& foot - Prescription and design & modification
6. Spinal conditions inclusive of fractures, spondylolisthesis, kyphosis, scoliosis etc.
7. Upper limb conditions – splinting prescriptions with principles
8. Prosthesis –
  - a. Upper & lower limb; endo skeletal & exo skeletal,
  - b. Hip, knee & foot prosthetic components with k-levels
  - c. Upper limbs: cosmetic restoration, terminal devices (body powered), self help devices (adl equipments), myoelectric, microprocessor / sensor controlled (externally powered)
  - d. Adaptive devices
9. Psychological & Physiological aspects of orthotic and prosthetic application
10. Material used in fabrication of Prosthetics & Orthotics briefly.
11. Mobility aids:  
canes, crutches, walking frames, walkers, wheel chairs manual / electrically powered.

<b>Topic Distribution for Paper Setting</b>	
<b>Section</b>	<b>Topics</b>
<b>I (55 marks)</b>	<b>Community Physiotherapy Rehabilitation</b>
<b>II (25 marks)</b>	<b>Assistive technologies</b>

## **5. ETHICS AND MANAGEMENT**

### **5.1 ETHICS**

#### **OBJECTIVES:**

At the end of the course the candidate will be able to:

1. Understand the moral values and meaning of ethics.
2. Acquire bedside manners and communication skills in relation with patients, peers seniors and other professionals.
3. Develop psychomotor skills for physiotherapist patient relationship.
4. Develop skill to evaluate and make decision for plan of management based on sociocultural values and referral practice.
5. Develop behavioral skills and humanitarian approach while communicating with patients, relatives, society at large and co-professionals.
6. Develop bedside behavior, respect & maintain patients' confidentiality.
7. Understand the importance of council, its functioning and Act.

#### **SYLLABUS:-**

1. Outlines of Gujarat State Council for Physiotherapists (GSCPT) Act 2011 with more emphasis on formation, functions of council, importance for registration etc.
2. Ethical principles in health care services, research, teaching related to physiotherapy.
3. Scope of practice as patient manager, consultant, critical inquirer, educator, administrator.
4. Rules of professional conduct
  - Physiotherapy as a profession
  - Relationship with patients
  - Relationship at health care institution i.e. hospital, clinic etc.
  - Relationship with colleagues and peers
  - Relationship with medical and other professionals
5. Confidentiality and responsibility
6. Malpractice and negligence
7. Professional development, competence and expertise
8. Sale of goods: personal and professional standards
9. Legal aspects: legal responsibility of physiotherapists for their action in the professional context understanding liability and obligations in case of medico legal action.

### **5.2 ADMINISTRATION, MANAGEMENT & MARKETING**

#### **OBJECTIVES:**

At the end of course the student will be able to:

1. Learn the management basics in fields of clinical practice, teaching, research and physiotherapy practice in the community.
2. Acquire communication skills in relation with patients, peers, seniors and other professionals & the community.
3. Acquire the knowledge of the basics in managerial & management skills, & use of information technology in professional practice.
4. Develop psychomotor skills for physiotherapy practice.
5. Develop skill to evaluate and make decision for plan of management based on sociocultural values and referral practice.



6. Develop behavioral skill and humanitarian approach while communicating with patients, relatives, society at large and co-professionals

**SYLLABUS:**

1. Management studies related to local health care organization management & structure, planning delivery with quality assurance & funding of service delivery, information technology and career development in physiotherapy.
2. Administration-principles-based on the goal & functions at large hospital set up/domiciliary services/private clinic/ academics.
3. Budget-planning.
4. Performance analysis- physical structure/ reporting system (man power, status, functions, quantity & quality of services, turn over, cost benefit revenue contribution)
5. Setting up therapeutic gymnasium, fitness clinics, cardiac and pulmonary rehab centers etc
6. Time management



## **6. BIO-STATISTICS & RESEARCH METHODOLOGY**

### **6.1 BIO-STATISTICS**

#### **OBJECTIVES: -**

At the end of the course the candidate will be able to

1. Recognize different variables as per their types and should be able to decide on how to treat them differently as per requirement
2. Differentiate complete enumeration and various forms of sampling (random: Simple, stratified, cluster, multi stage; non random: snow ball, quota, purposive, convenient) with understanding of merits and demerits of them
3. Decide when to apply what test or a measure of central tendency according to the need of the data and OBJECTIVES
4. Interpret a given output of regression or ANOVA according to the context.

#### **SYLLABUS:-**

1. Introduction to statistics in physiotherapy.
2. Understanding 'Data' and its types.
3. Presentation of various data: tables, graphs and descriptive statistics.
4. Measures of central tendencies (CT): mean, median, mode; merits and demerits; when to apply which measure of CT for the given data.
5. Measures of dispersion: range, mean deviation, standard deviation, coefficient of variance
6. Application of normal distribution and its properties.
7. Testing of hypothesis (measuring change): one sample with population, comparing two samples( Z test for proportion, difference of two proportion, independent sample 't' test, paired 't' test, chi square test.
8. Conceptual understanding of correlation, linear and multiple regression, analysis of variance (ANOVA) and analysis of co-variance (ANCOVA).
9. Complete enumeration and sampling methods: random: simple, stratified, cluster, multi stage; non random: snow ball, quota, purposive, convenient.
10. Simple statistical analysis through excel.

### **6.2 RESEARCH METHODOLOGY**

#### **OBJECTIVES: -**

At the end of the course the candidate will be able to

1. Understand and differentiate various study designs.
2. List the need of methodical and regular literature search in research
3. Plan a study choosing an appropriate design for a given problem according to given objectives.

#### **SYLLABUS:-**

1. What is research? Why research?
2. Types of epidemiological studies & measurements of various indications.
3. Possible errors that may generate due to study design & how to overcome them.
4. How to read and what to read from journals.
5. Role of research in Physiotherapy.
6. Components of research proposal – introduction and rationale, material & methods, results and discussion.
7. Where to look for good literature and why.
8. The Evidence Based Practice.